SANYO

Service Manual

Shaker for CO_2 incubator

FILE No.

MIR-S100C

SANYO Electric Co., Ltd.
Biomedical Business Division

SM9910238

Effective models

This service manual is effective for following models.

Name	Product code	Voltage and Frequency	
MIR-S100C	823 288 51	115V	60Hz
	823 288 54	230/240V	50Hz

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Specifications

Structural specifications

Item		Descriptions	
Name		Shaker for CO_2 incubator	
Model		MIR-S100C	MIR-S100C (for Europe)
External dimensions	Shaking part	W409 x D275 x H118 mm	
	Control part	W365 x D275 x H93 mm	
Exterior	Shaking part	Copper alloyed stainless steel	
	Control part	Painted steel	
Platform dimensions		W380 x D250 mm	
Platform		Copper alloyed stainless steel	
Shaking motion		Circling	
Amplitude (Circling diameter)		20 mm	
Revolution		40 ~ 200rpm	
Allowable load weight		5 kg	
Flask intake capacity		100ml Erlenmeyer Flask x 15, 500ml Erlenmeyer Flask x 5 (MIR-38PFT) 100ml Erlenmeyer Flask x 11, 500ml Erlenmeyer Flask x 6 (MIR-38PFN)	
Display		3-digit LED (speed/time changeable)	
Motor		DC brushless motor	
Accessories		Rubber cap for MIR-S100C x 2, Power supply cord, Stand, Rubber foot x 4, Screw (M5) x 4	
		Cable (3m) x 2(10pins and 4pins)	Cable (3m) with ferrite cores x2 (10 pins and 4 pins)
Power source		Local voltage	
Weight		16 kg	
Optional components		Platform (MIR-38PFT, MIR-38PFN) Clamp (MIR-51FC, MIR-101FC, MIR-201FC, MIR-301FC, MIR-501FC, MIR-1001FC, MIR-2001FC) Test tube rack (MIR-204SC), Spring rack (MIR-38SP)	

Control specifications

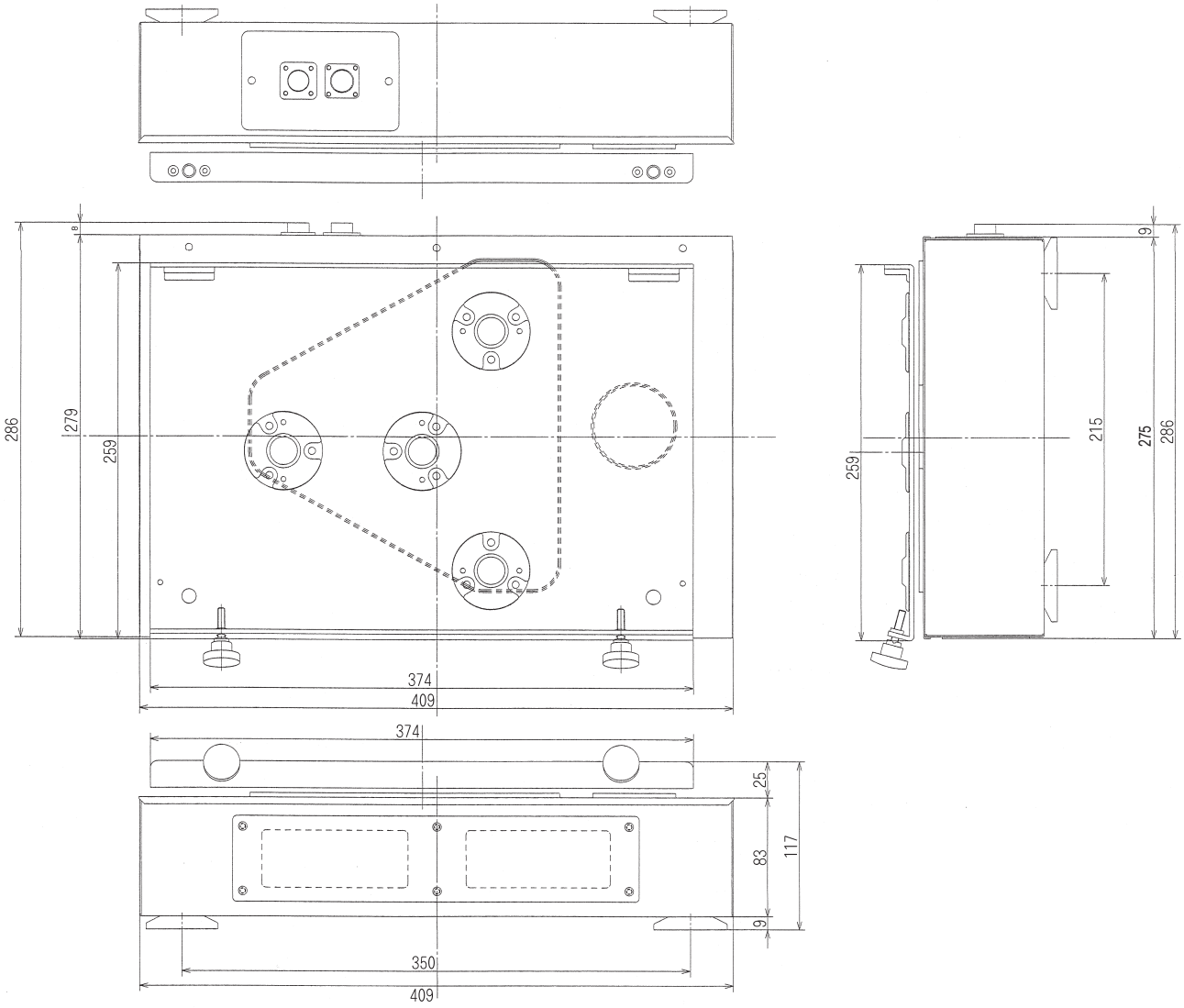
Item	Descriptions
Rotational acceleration	By rotational acceleration in revolution speed, prevent culture from being bubbled or spilled out from test tube or Erlynmeyer flask.
Timer	Settable range: 0 ~ 99.9hours Unit: 0.1hour (6min.)
Accumulated running time	Accumulated running time is displayed in F13.
Key lock	Keys on control panels are inoperative when “Key lock” is “ON”.
Auto start after power failure	A shaker will start running after a power failure.
Revolution speed abnormality	When revolution speed is not reached or over setting speed, “E07” will blink on the display.
Motor overload protection	When a motor is overloaded or over-current is detected, a shaker will stop running and “E06” will blink on the display.
Over-current breaker	Sharing with power switch

Performance specifications

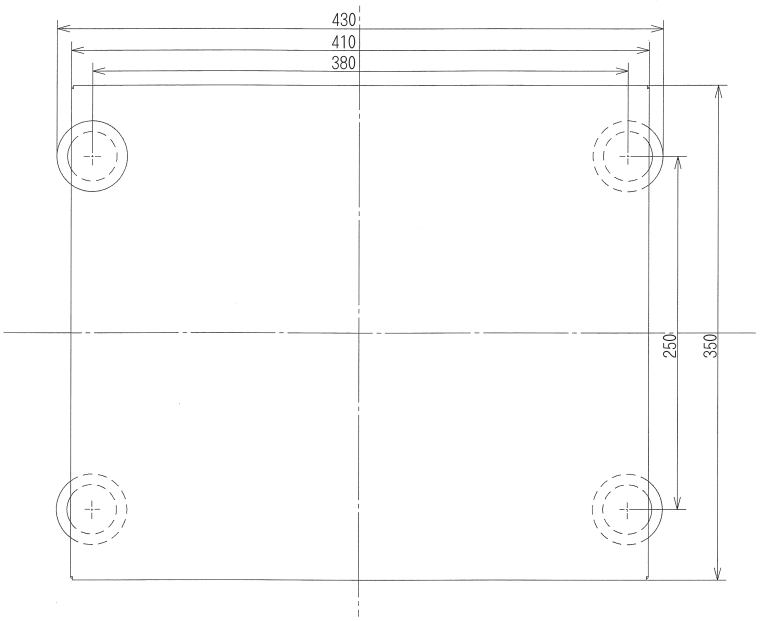
Item		Descriptions	
Maximum power consumption		17.6W	
Total maximum current		115V, 60Hz	230V, 50Hz
		Max. 0.16A	Max.0.11A
Maximum heat emission		63 kJ/h	
Noise level		38.9dB	
Usable environment condition	Shaking part	Temperature; 0~50℃ in CO_2 chamber	
	Control part	Temperature; 0~40℃ Humidity; Equal or less than 80%R.H.	

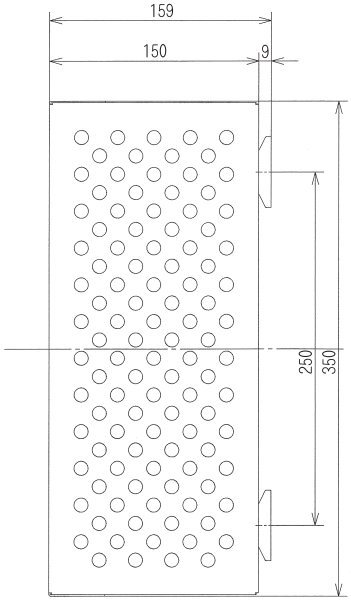
Dimensions

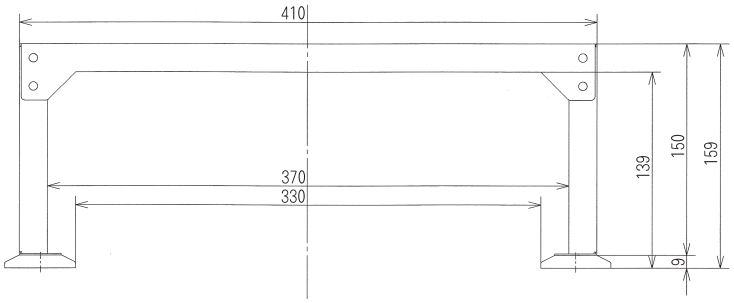
< Shaking part >



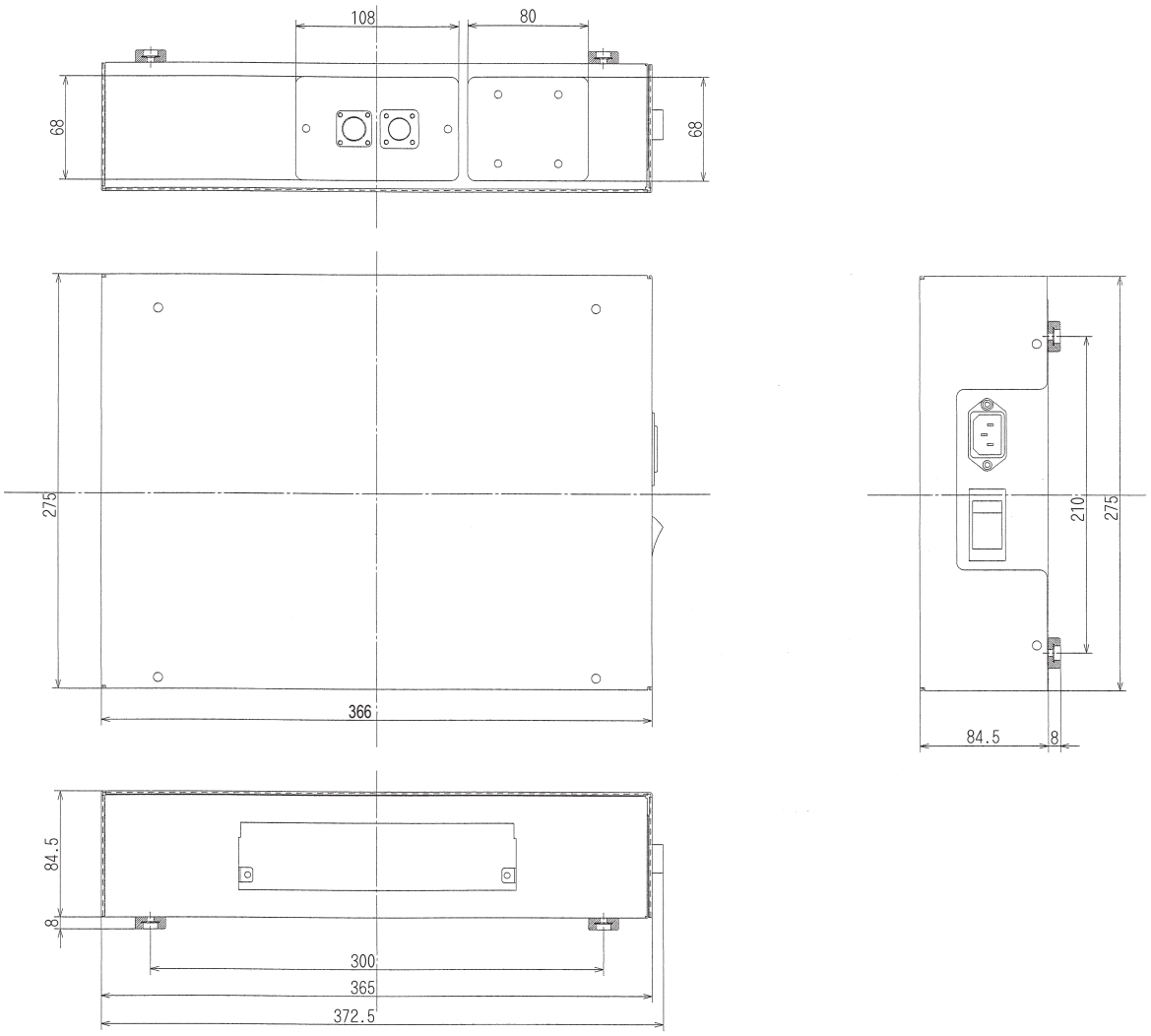
< Stand >







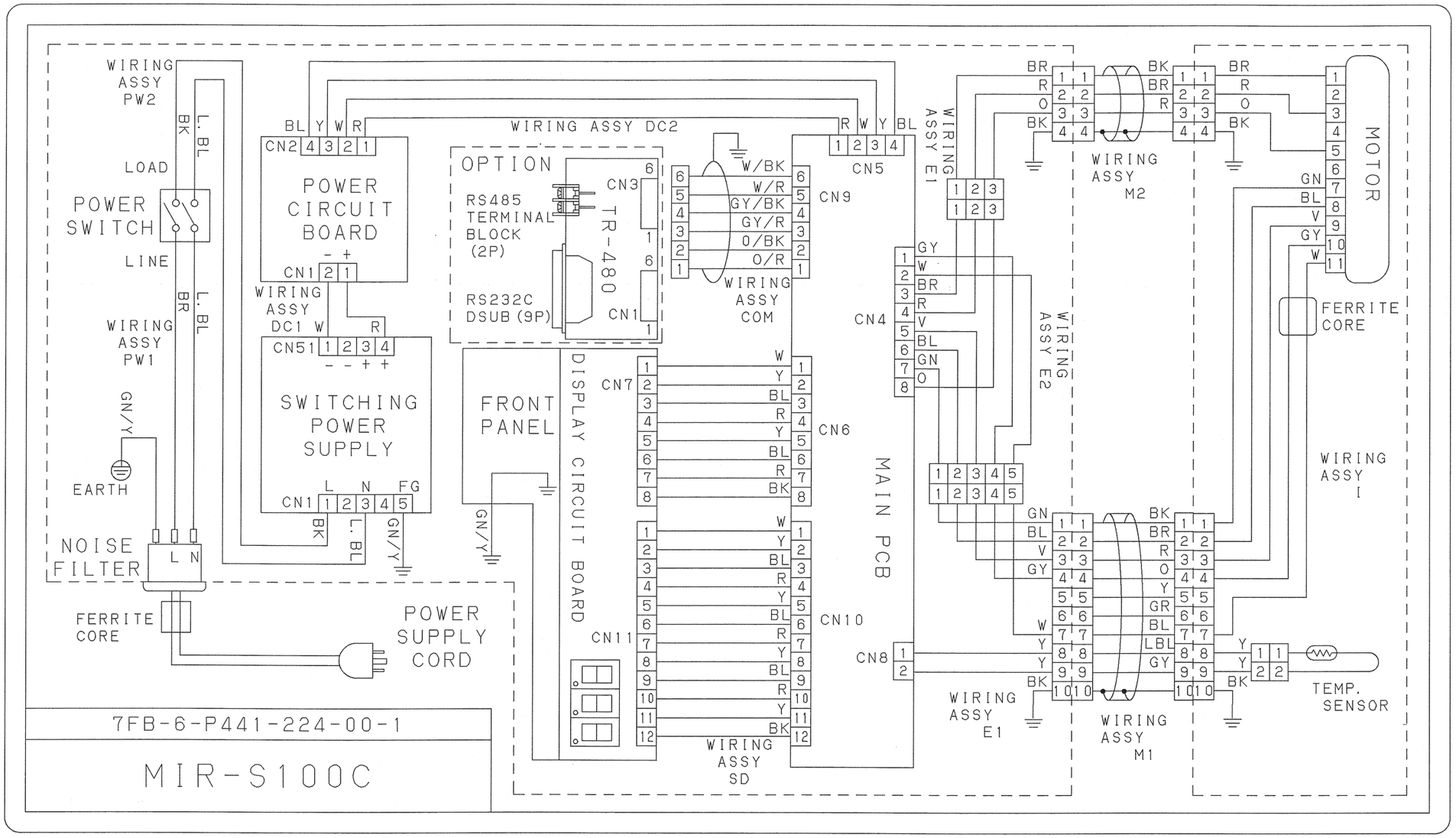
< Control part >



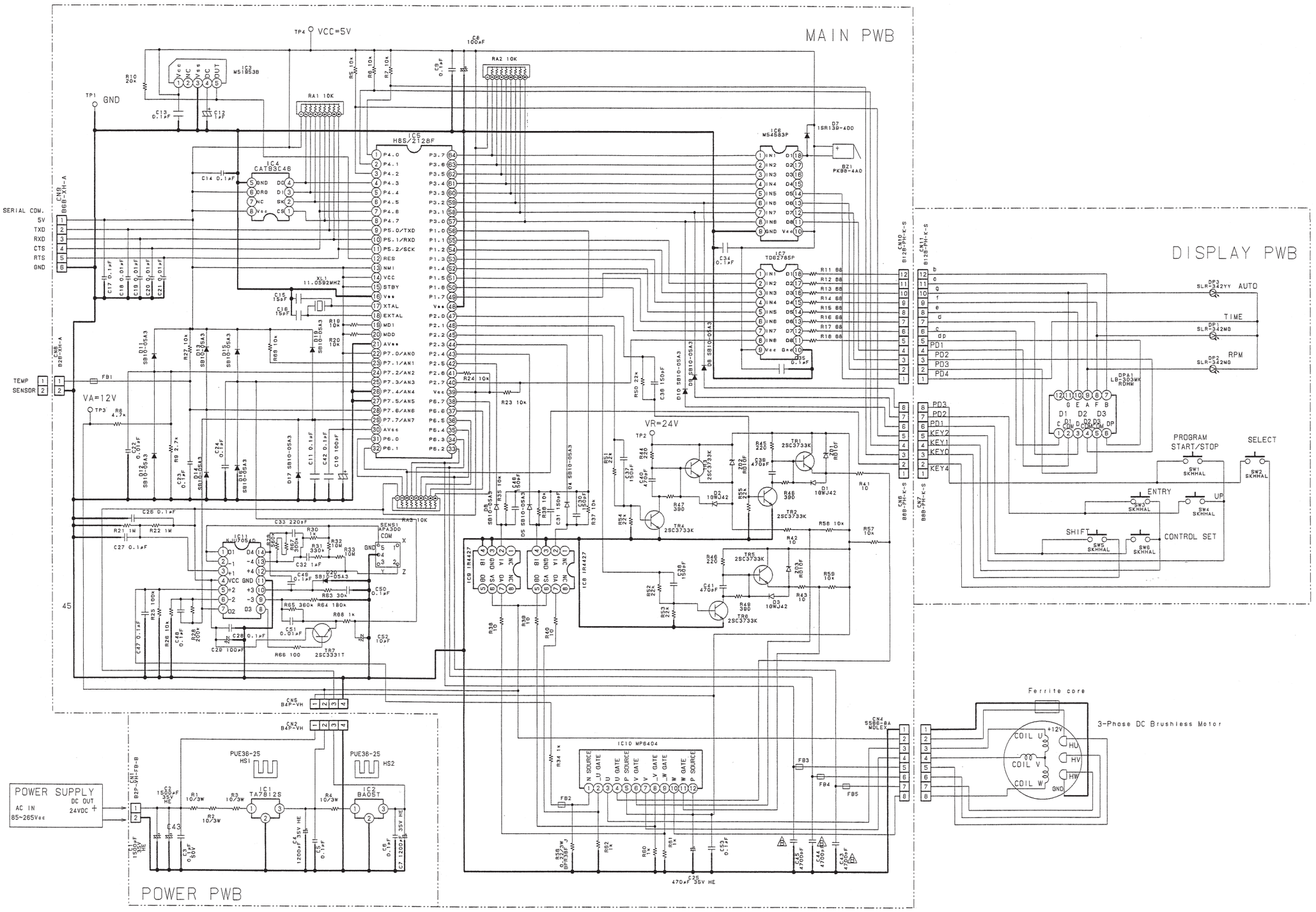
Electric parts

Part name		Specifications	
		115V, 60Hz	230/240V, 50Hz
Noise filter	Type	ZUG2210-11	ZUG2210-11
	Rating	10A	10A
Power supply cord	Rating	AC125V, 12A	AC125V, 12A
Motor	Type	FY8S25H-D3	FY8S25H-D3
	Rating	3P, brushless	3P, brushless
Power switch	Type	BAM205171	BAM205171
	Rating	AC250V, 5A	AC250V, 5A
Switching power supply	Type	ZWS50AF-24/J	ZWS50AF-24/J
	Rating	AC24V, 50W	AC24V, 50W
Temp. sensor	Type	103AT-1	103AT-1
	Rating	10kΩ, 25℃	10kΩ, 25℃

Wiring diagram



Circuit diagram



Connections on PCB

Following shows connections on Main PCB.

Connecter	Connects to		Usage
CN1	Switching power supply	CN1: #1-#3 100V CN51:#1-#4 DC24V	To supply the power to PCB.
CN2	Main PCB	#1-#4 DC24V #2-#4 DC12V #3-#4 DC5V	To supply the power to PCB.
CN3	MTR-480 (Option)		To connect with MTR-480 (option).
CN4	DC motor	#1-#2 DC12V	To control brushless DC motor.
CN5	Power PCB		To connect with Power PCB.
CN6	Display PCB		To connect with Display PCB.
CN7	Main PCB		To connect with Main PCB
CN8	Temp. sensor		To detect internal temperature.
CN9	MTR-480 (Option)		To connect with MTR-480 (option).
CN10	Display PCB		To connect with Display PCB.
CN11	Main PCB		To connect with Main PCB.

Specification of sensor

Temperatures and resistances of thermistor (Type:103AT-1)

Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)
0	27.28	28	8.94	56	3.43
1	26.13	29	8.64	57	3.32
2	25.03	30	8.31	58	3.22
3	23.99	31	8.02	59	3.12
4	22.99	32	7.73	60	3.02
5	22.05	33	7.46	61	2.93
6	21.15	34	7.19	62	2.84
7	20.29	35	6.94	63	2.75
8	19.48	36	6.70	64	2.67
9	18.70	37	6.47	65	2.59
10	17.96	38	6.25	66	2.51
11	17.24	39	6.03	67	2.44
12	16.55	40	5.83	68	2.37
13	15.90	41	5.63	69	2.30
14	15.28	42	5.44	70	2.23
15	14.68	43	5.26	71	2.16
16	14.12	44	5.08	72	2.10
17	13.57	45	4.91	73	2.04
18	13.06	46	4.75	74	1.98
19	12.56	47	4.59	75	1.92
20	12.09	48	4.44	76	1.87
21	11.63	49	4.30	77	1.82
22	11.20	50	4.16	78	1.77
23	10.78	51	4.02	79	1.72
24	10.38	52	3.90	80	1.67
25	10.00	53	3.77	81	1.62
26	9.63	54	3.65	82	1.58
27	9.28	55	3.54	83	1.53

Control specifications

1. Keypads on control panel

SELECT : Press this key to change display for revolution speed or running time.

SET : Press this key to step to setting mode for revolution speed or running time.

▶▶ (Digit shift key): Pressing this key in setting mode enables the changeable digit to shift.
Press this key for 5 seconds to step to Key Lock mode and “L_0” is displayed.

▲▲ (Numerical value shift key): Pressing this key in setting mode enables the numerical value to change.
Press this key for 5 seconds to step to Function mode and “F00” is displayed.

ENT : In setting mode, Function mode and Key Lock mode, press the key to ensure and to memorize the setting value.

START/STOP : Press this key to start shaker running. Press this key again to stop the shaker.
Pressing this key for 3 seconds to change over ON/OFF in auto limit function.

2. Setting range and display

(1) Setting range

Revolution : 40~200 rpm

Running time : 00.0~99.9 hours (Unit: 0.1hours)
Setting “00.0” causes a shaker to keep running.

(2) Examples of display

Revolution “362 rpm”	362
Running time “1.2hours”	1.2
Running time “5minuites and 45seconds”	5.45
Running time “15hours and 24minutes” (15.4 hours)	15.4

3. Error codes and self-diagnosis function

(1) Error code

E06: Abnormal current in brushless motor
E07: Abnormal revolution speed
E08: Abnormal shaker temperature

If above errors occur;

- A shaker stops running
- An error code and revolution speed (or running time) are alternately displayed
- Buzzer sounds intermittently

Turning the power off and on enables to cancel an error code.

E06 (Abnormal current in motor) will be occurred;

- When a current in brushless motor is over 3.5V(0.8A)
- When a current in brushless motor is over 0.9V when revolution speed is 0rpm.
- When IC signal is not changed for 255msec and a current inn brushless motor is over 0.9V.

E07 (Abnormal revolution speed) will be occurred;

- When revolution speed is less than 10rpm and it does not pass 30seconds after the shaker starts running.
- When revolution speed is 20rpm less than setting speed and it passes 120seconds after the shaker starts running.
- When revolution speed deviates from setting speed +/- 10rpm after it is diagnosed that the revolution speed is stabilized (it was reached setting speed +/- 2rpm for 15seconds).

E08 (Abnormal shaker temperature) will be occurred;

- When a shaker temperature is over 72℃ which was detected by thermistor.

(2) Power failure alarm:

"PF" and current revolution speed are alternately displayed when the power retrieves from the power failure.
Pressing any key on the control panel enables to cancel "PF" displaying.

(3) Failure predicting function

There are 3 predicting codes (CH1, CH2, CH3) which notify the abnormality in a shaker, such as blinking code twice when the power will be supplied.
It is not notified by audible alarm.

CH1: Notify that accumulated running time is over 10000 hours and both bearings and belts should be replaced.
After replacing them, step to F13 and input "000" to reset accumulation time..
Press ENT key to complete reset and "CH1" is eliminated from the display.

CH2: Notify that revolution speed is abnormal when;

- Revolution speed in brushless motor reaches 100rpm and it passed over 90seconds after the shaker started running when setting speed is more than 100rpm.
- Revolution speed in brushless motor reaches setting speed -2rpm and it passed over 90seconds after the shaker started running when setting speed is less than 100rpm.

If there was "CH2" on the display just before the power was turned off, "CH2" will blink when the power is supplied.
If there are occurred "CH1" and "CH2" simultaneously, it has priority to display "CH1".

CH3: Notify that accumulated running time is over 5000 hours and belts should be replaced.
"CH3" will blink two times when the power is supplied.
Audible alarm will not sound.
After replacing belts, step to F13 and input "999" and press ENT key to eliminate "CH3" from the display. (Accumulated running time is not reset)

4. Key Lock

Press ▶▶ key for 5seconds to blink "L 0" on the display. Change to "1" from blinking "0" by using ▲ Key. Pressing ENT key makes Key Lock "ON".
Pressing ▶▶ key for 5seconds and press ENT key when Key Lock is "ON" makes Key Lock "OFF".

When Key Lock is "ON";

- Unacceptable to use START/STOP key
- Unacceptable to use ▶▶ key and ▲ key so that setting value cannot be changed.
- Acceptable to use Function code
- It remains Key Lock is "ON" if the power turns off and on.

5. Auto return

If there is no key operation for 90seconds during setting mode or Key Lock mode or Function mode, a device will automatically return to current setting (revolution speed or time) display and a value to change will be not stored.

6. Adjustment of revolution speed

See descriptions in F24 of “7. Function mode”.

7. Function mode

It is unnecessary to input service code, “384” prior to use following function codes;

- F00: Automatically revert to PV display
- F06: Input of service code “384”
- F21: Setting of Serial communication (ID)
- F22: Setting of Serial communication mode
- F23: Setting of rotational acceleration

It is necessary to input service code, “384” prior to use following function codes;

- F07: Unused function
- F08: Unused function
- F09: Initialization of non-volatile memory (EEPROM)
- F10: Display of ROM version
- F11: Unused function
- F12: Unused function
- F13: Setting and display of accumulated running time
- F14: Setting of counting speed of running time
- F15: Setting of diagnosis for E07 and CH2 (abnormal revolution speed)
- F16: Display of shaker temperature
- F17: Display of current level in brushless motor
- F19: Display of shaking level in the front and back direction
- F23: Setting of rotational acceleration
- F24: Setting of adjustment data for revolution

How to access to Function mode: Press ▲▲ key over 5seconds to step to Function mode and “F00” is displayed. Input function code by pressing ▲▲ key and ▶▶ key and press ENT key.

F06:
<Purpose> Input of service code “384” when using function mode
<Operation> Input F06 and press SET key to display “000” (Factory default). Set to “384” with ▲▲ key and ▶▶ key. Press SET key to store the value and revert to PV display.
<Cancel> Input “F06” and press ENT key to display “000”. Input “384” by pressing ▲▲ key and ▶▶ key. Press ENT key to return a device to current setting display.

Note) Service code “384” will be memorized until “000” is input again in F06 or a main power is turned off.

F09:
<Purpose> Initialization of Non-volatile memory
<Operation> **This mode must be used only when data can’t be memorized in non-volatile memory.**
Input service code in F06 prior to using this mode.

Input F09 and press ENT key to display “00.0” (Factory default).
Change the 1st digit to “1” and press ENT key to initialize following data in non-volatile memory;

Item	Factory default
Revolution speed	50 rpm
Running time	00.0 hr (continuous running)
Communication ID	000
Communication mode	000
Check code	114 (=0x72)
Abnormal shaking	Level 5
Rotational acceleration	Level 2
Key Lock	0 (OFF)

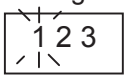
Following values are memorized to prevent being eliminated during power failure;

Item	Factory default
Running time	0
Status flag	0
6min. timer	360

Following data are not initialized;

- Zero adjustment data (F11)
- Zero adjustment data for revolution speed(F24)
- Accumulated running time (F13)
- Service code “384” (F06)

F10: <Purpose> Display of ROM version
<Operation> Input service code in F06 prior to using this mode.
Input F10 and press ENT key to display the current ROM version.
Ex) Ver.1.2 ⇒ Displays as “u1.2”

F13: <Purpose> Setting and display of accumulated running time
<Operation> Input service code in F06 prior to using this mode.
Input F13 and press ENT key to display accumulated running time and its 3rd digit (left digit) blinks.
Ex.) accumulated running time is “12345 hours”
Displays as 

Note) 2 digits at right side (e.g. 4 & 5) are not displayed.

At the time press ENT key to revert to PV display.
When you replace consumable components, set “000” by pressing ⏫ key and ⏩ key and press ENT key to reset the accumulated running time to “0”.
When a shaker is running continuously and the accumulated running time reaches 99.9hours, the display will be reset to “0”. (99.9hours will be accumulated)
If counting speed is setting to “rapid” in F14, running time will not be accumulated.

F14: <Purpose> Setting of counting speed of running time
<Operation> Input service code in F06 prior to using this mode.
Input F14 and press ENT key to blink the 1st digit (right digit).
When you set “1” in the 1st digit, counting speed of running time will be “rapid”. (0.1hours = Counting as 1 second)
When you set “0” in the 1st digit, counting speed of running time will be “normal”.
Running time will not be accumulated ruing counting speed is “rapid”.

F15: <Purpose> Setting of diagnosis for E07 and CH2 (abnormal revolution speed)
<Operation> Input service code in F06 prior to using this mode.
Input F15 and press ENT key to blink the 1st digit (right digit).
When you set "1" in the 1st digit, a device will not diagnose E07 and CH2.
When you set "0" in the 1st digit, a device will diagnose E07 and CH2.

F16: <Purpose> Display of current shaker temperature
<Operation> Input service code in F06 prior to using this mode.
Input F16 and press ENT key to display current shaker temperature.
Ex) 12.3℃ ⇒ Displays as "12.3"

F17: <Purpose> Display of motor voltage which is exchanged from current
<Operation> Service code should be input in F06 prior to using this mode.
Input F17 and press ENT key to display a voltage in a motor.
Current will be amplified 20 times by using resistance 0.22Ω.
Calculation: current x 0.22Ω x 20
Ex) 1.23V ⇒ Displays as "123"

F19: <Purpose> Display of shaking level in the front and back direction
<Operation> Service code should be input in F06 prior to using this mode.
Input F19 and press ENT key to display shaking level.

Ex) 1.23V ⇒ Displays as "123"

F21: <Purpose> Setting of serial communication ID
<Operation> Input F21 and press ENT key to display "000".
Input a numbers which identify shaker and press ENT key to set serial communication ID.
Setting range is "000"~"255".
000: Communication is OFF

F22: <Purpose> Setting of serial communication mode
<Operation> input F22 and press ENT key to display "000" (Factory default)
Change the 3rd digit to alternative "0" or "1" to set control mode.
Change the 2nd digit to selectable "0" or "1" or "2" to set baud rate.

Control mode (the 3rd digit)
0: Local (default setting)
1: Remote
Baud rate (the 2nd digit)
0: 2400bps
1: 4800bps
2: 9600bps

Note) When you have control in "Remote", revolution speed will not be changed because ENT key is unacceptable.

F23: <Purpose> Setting of rotational acceleration (speed to reach setting revolution)
<Operation> Input F23 and press ENT key to set rotational acceleration in "1" or "2" or "3".
"1" = Slow
"2", "3" = Fast

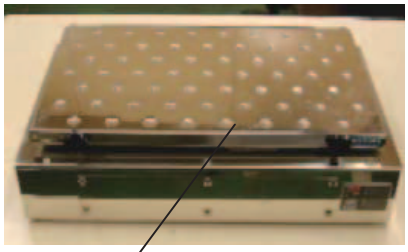
F24: <Purpose> Revolution speed adjustment

<Operation> Service code should be input in F06 prior to using this mode.
When revolution speed is stabilized at 300rpm, set F24 and press ENT key to display revolution speed which will be not adjusted. (Default: 200)

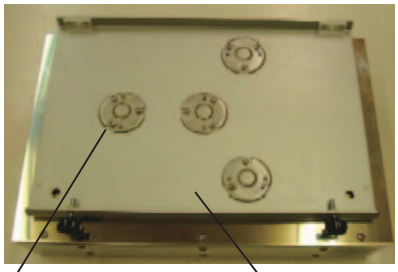
(Ex.) When a current reading value is 204rpm, input the value by using ⏫ key and ⏩ key and press ENT key to memorize the value.
Every time the setting value is changed, adjustment value should be calculated and subtracted from a reading value.
Setting range: 140~260 rpm

Parts layout

Shaking part

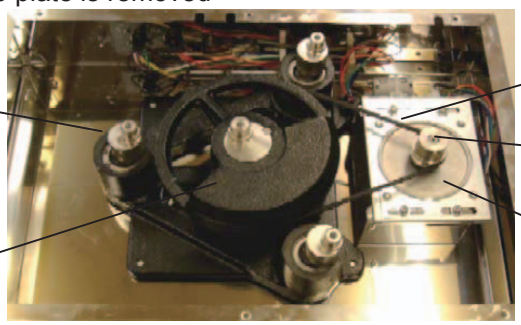


Platform



Cover for bearing Top plate

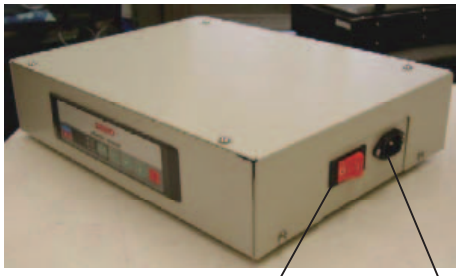
<Top plate is removed>



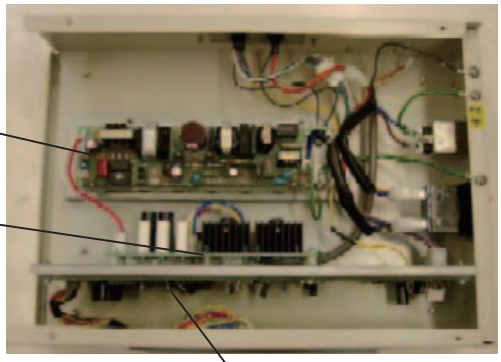
Bearing
Belt
Pully
Brushless motor
Base ass'y

Control part

Control panel



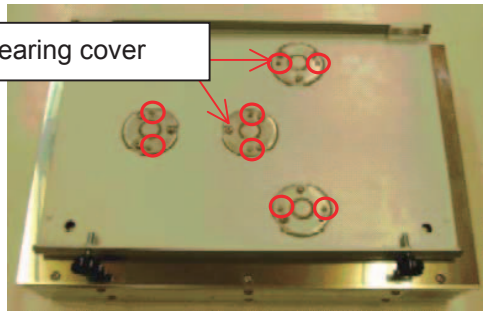
Power switch Power cable port



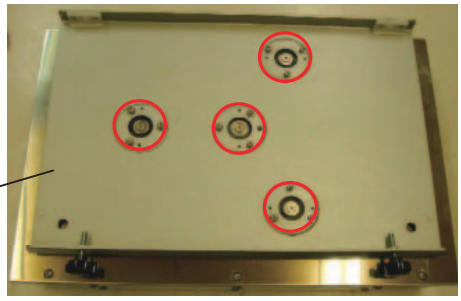
Switching power supply
Power PCB
Main PCB

Replacement of Belt

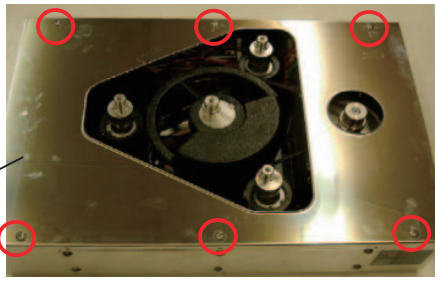
1. Loosen and remove screws which secure bearing covers.



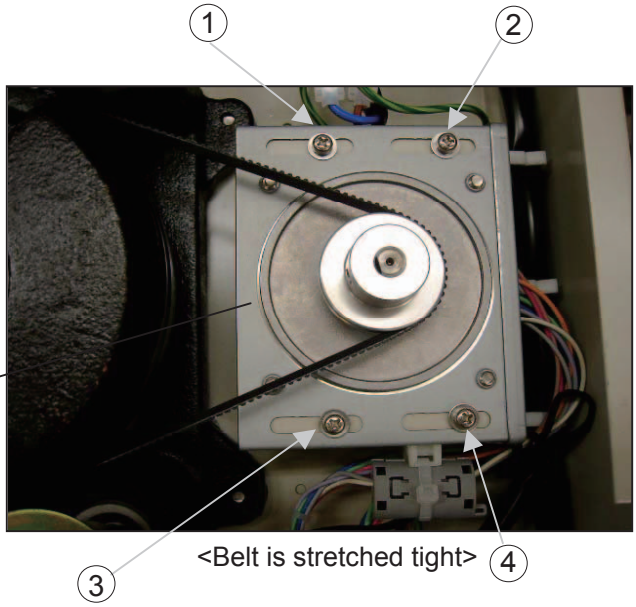
2. Loosen and remove hexagon socket screws.
   Pull up "Top plate" from "Frame cover" by hand.



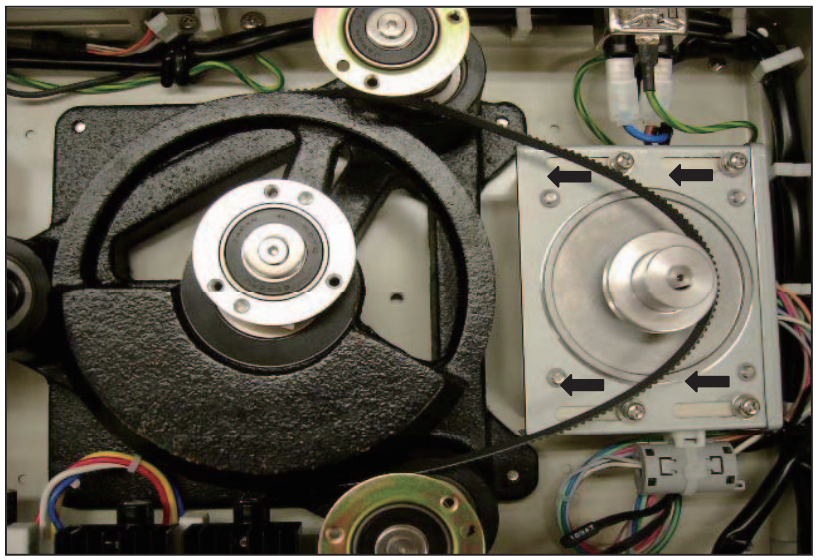
3. Loosen and remove 6 screws which are specified in the right picture.
   Remove "Frame cover".



4. Loosen 4 screws ①②③④ which are specified in the right picture.



5. Move fitting plate toward left to loosen and remove the belt.



<Belt is not stretched>

6. After replacing with new belt, move fitting plate toward right and tighten screws to secure the fitting plate.

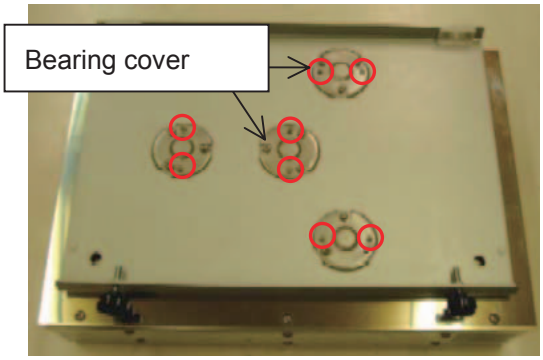
7. Ensure belt tension should be 16.5+/-2.5(N).
   Another way to check belt tension is;
   Ensure it should be warped by 1.23mm when load 1.1+/-0.2(N) is added in the center of belt.
   Gap allowance in the pully should be within +/-0.77mm.

8. Follow the procedure 1~6 in the viceversa.

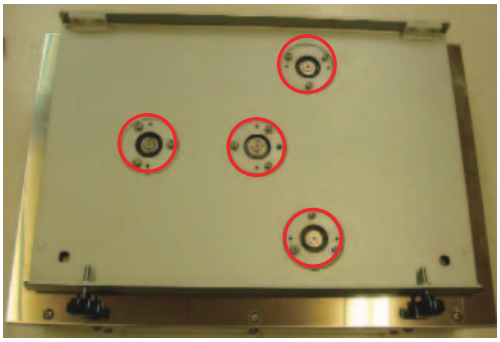
9. Input "999" in F13 to eliminate "CH3" from display. Accumulated running time will be continued.

*** For the timing of replacing belt, see the description about "Replacement of consumable parts " in P.18 of the Instruction Manual.

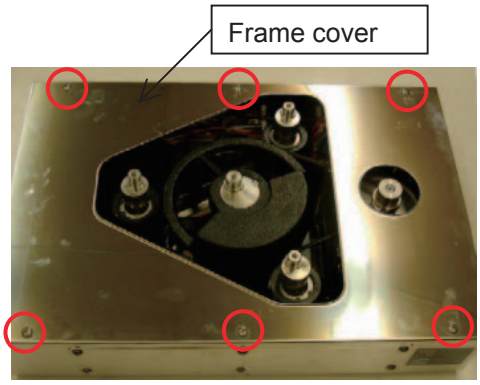
Replacement of Top Plate bearings



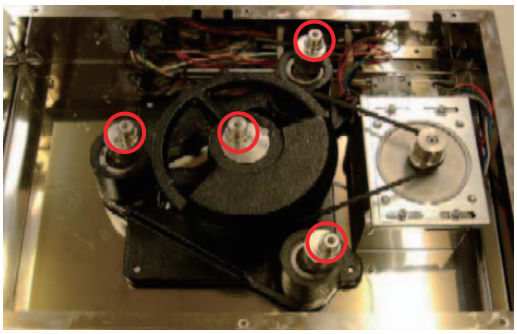
1. Loosen and remove screws which secure bearing covers.



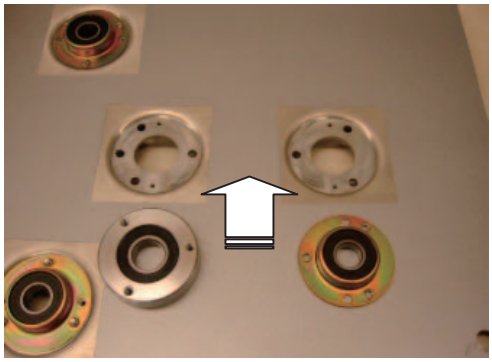
2. Remove hexagon socket screws which secure bearings and pull up the Top plate from the frame cover by hand.



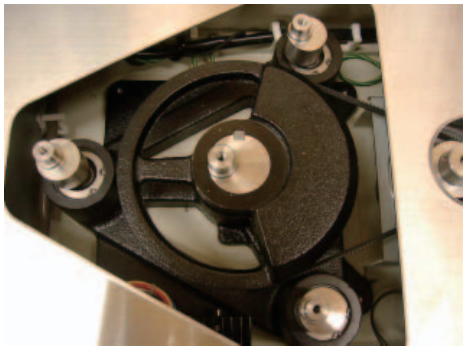
3. Remove 6 screws which secure frame cover.



4. Remove bearing ass'y (4 sets) from each shaft.

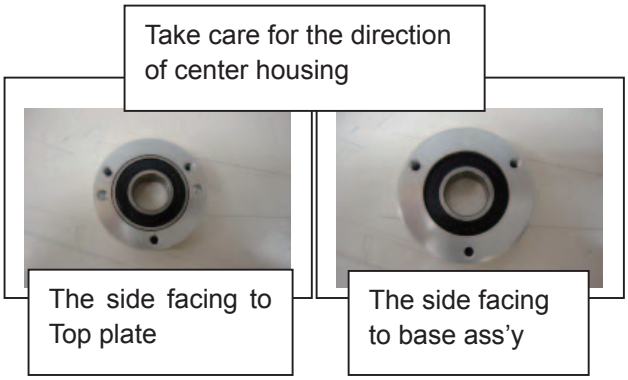


5. Align new bearing ass'y (4 sets) with holes on Top plate and secure them by screws.
*Screws torque should be 245N/cm (25kgf/cm)



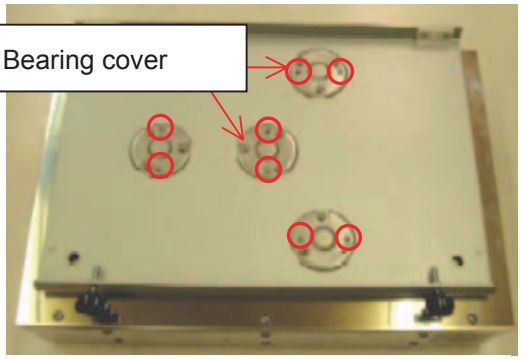
6. Align guide shaft with center shaft and to follow the procedure 4 then 3 to fit Top plate ass'y back to the position.

7. Paste silicone grease over inside bearings and fit bearings back to each shaft.

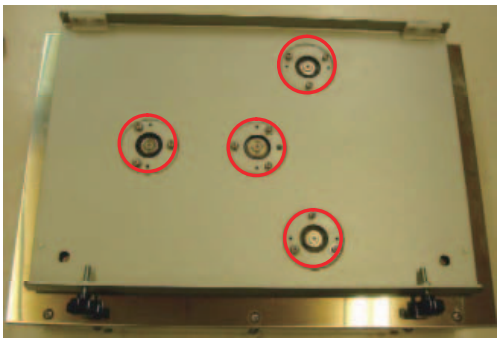


* For the timing of replacing bearing, see P.20 "Replacement of consumable parts" in Instruction Manual.

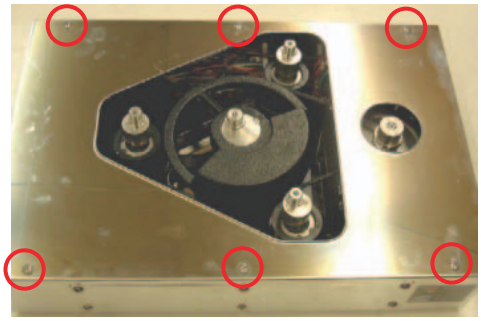
Replacement of Base Ass'y bearings



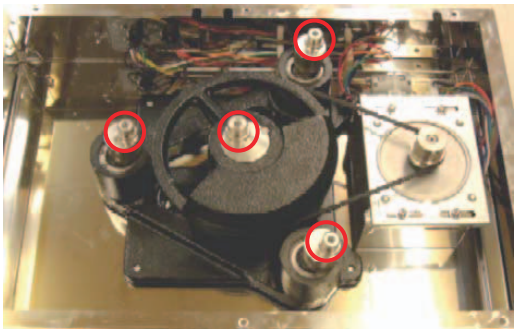
1. Loosen and remove screws which secure bearing covers.



2. Loosen and remove hexagon socket screws which secure bearings. Pull out Top Plate from the frame cover.



3. Loosen and remove 6 screws which secure Frame Cover.

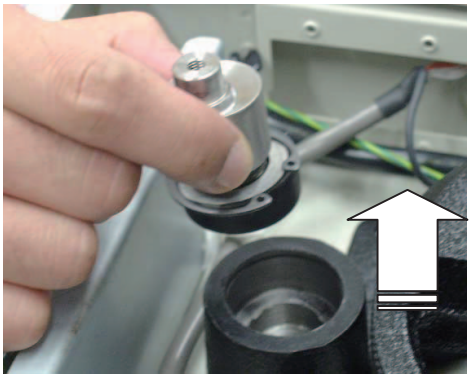


4. Remove Guide Housing and Center Housing.

Hook

5. Catch the hook by wrench and release C-ring from the Base Ass'y.

6. C-ring is released.



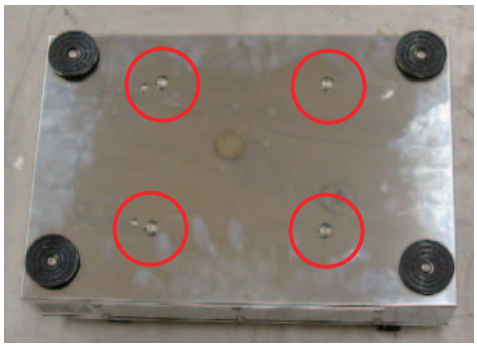
7. Pull out Guide Shaft Bearing Ass'y.

8. Paste silicone grease over Base Ass'y and replace with new Guide Shaft Bearing Ass'y.

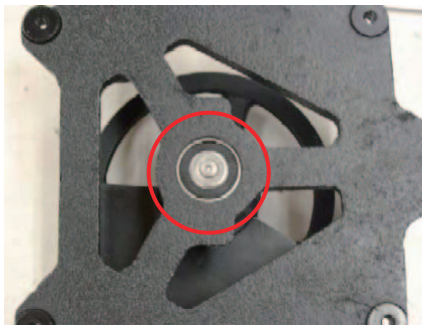
Note) Ensure C-ring should be mounted with flat side down.

9. After replacement is complete, step to F13 and input '000' to reset accumulation time.

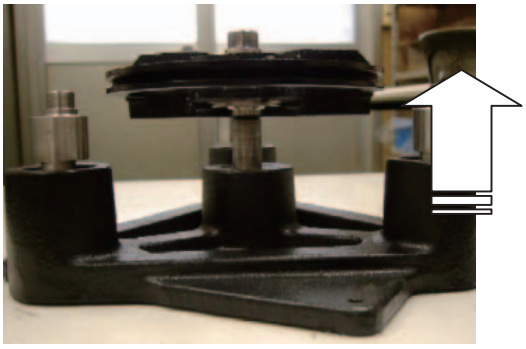
Replacement of Base Ass'y



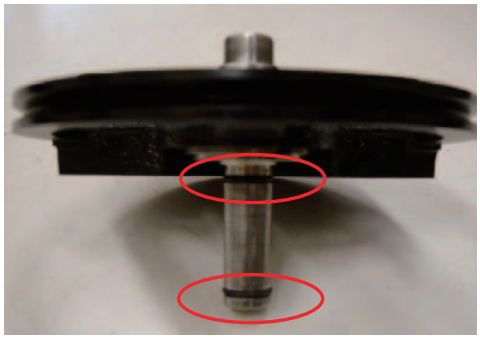
1. Loosen and remove 4 screws and remove Base.



2. Loosen and remove hexagon socket screw from Base.



3. Turn Base over and pull out Center Shaft Ass'y from Base.



4. Ensure O-rings which fit with shaft should not be cracked or torn.
If they are damaged, replace with new ones.

5. After replacing procedure is complete, follow the procedure 1~3 vice versa to mount Center Shaft Ass'y back.

Torque for hexagon socket screw; 245N/cm (25kgf/cm)

Instruction manual

・This section is extracted and printed from Instruction Manual.

・If you find out “Refer to page ●●” in them, this page means not page in Service manual but page in the lower corner of each page in the extract from Instruction Manual.
This page number is not corresponded with serial number in Service manual.

・**The attached Instruction Manual corresponds to the specifications for initial production, so the contents may be changed without notice.**

SANYO

INSTRUCTION MANUAL

MIR-S100C

Shaker for CO_2 incubator

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INTRODUCTION

■ Read this manual carefully before using the appliance and follow the instructions for safety operation.

■ Sanyo never guarantee any safety if the appliance is used for any objects other than intended use or used by any procedures other than those mentioned in this manual.

■ Keep this manual in an adequate place to refer to it as necessary.

■ The contents of the manual will be subjected to change without notice due to the improvement of performance or functions.

■ Contact Sanyo sales representative or agent if any page of the manual is lost or page order is incorrect.

■ Contact Sanyo sales representative or agent if any point in this manual is unclear or if there are any inaccuracies.

■ No part of this manual may be reproduced in any form without the expressed written permission of Sanyo.

PRECAUTIONS FOR SAFE OPERATION

It is imperative that the user complies with this manual as it contains important safety advice.

Items and procedures are described so that you can use this unit correctly and safely.
If the precautions advised are followed, this will prevent possible injury to the user and any other person.

Precautions are illustrated in the following way:

⚠WARNING

Failure to observe WARNING signs could result in a hazard to personnel possibly resulting in serious injury or death.

⚠CAUTION

Failure to observe CAUTION signs could result in injury to personnel and damage to the unit and associated property.

Symbol shows;

△ this symbol means caution or warning.

⃠ this symbol means an action is prohibited.

● this symbol means an instruction must be followed.

Be sure to keep this manual in a place accessible to users of this unit.

⚠WARNING

Do not use the unit outdoors. Current leakage or electric shock may result if the unit is exposed to rain water.

Only qualified engineers or service personnel should install the unit. The installation by unqualified personnel may cause electric shock or fire.

Install the unit on a sturdy floor and take an adequate precaution to prevent the unit from turning over. If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.

Never install the unit in a humid place or a place where it is likely to be splashed by water. Deterioration of the insulation may result which could cause current leakage or electric shock.

Never install the unit in a flammable or volatile location. This may cause explosion or fire.

Never install the unit where acid or corrosive gases are present as current leakage or electric shock may result due to corrosion.

Always ground (earth) the unit to prevent electric shock. If the power supply outlet is not grounded, it will be necessary to install a ground by qualified engineers.

Never ground the unit through a gas pipe, water main, telephone line or lightning rod. Such grounding may cause electric shock in the case of an incomplete circuit.

Connect the unit to a power source as indicated on the rating label attached to the unit. Use of any other voltage or frequency other than that on the rating label may cause fire or electric shock.

Do not insert metal objects such as a pin or a wire into any vent, gap or any outlet on the unit. This may cause electric shock or injury by accidental contact with moving parts.

Use this unit in safe area when treating the poison, harmful or radiate articles. Improper use may cause bad effect on your health or environment.

Turn off the power switch (if provided) and disconnect the power supply to the unit prior to any repair or maintenance of the unit in order to prevent electric shock or injury.

Do not touch any electrical parts (such as power supply plug) or operate switches with a wet hand. This may cause electric shock.

⚠WARNING

Ensure you do not inhale or consume medication or aerosols from around the unit at the time of maintenance. These may be harmful to your health.

Never splash water directly onto the unit as this may cause electric shock or short circuit.

Never put containers with liquid on the unit as this may cause electric shock or short circuit when the liquid is spilled.

Never bind, process, or step on the power supply cord, or never damage or break the power supply plug. A broken supply cord or plug may cause fire or electric shock.

Do not use the supply cord if its plug is loose. Such supply cord may cause fire or electric shock.

Never disassemble, repair, or modify the unit yourself. Any such work carried out by an unauthorized person may result in fire, or electric shock or injury due to a malfunction.

Disconnect the power supply plug if there is something wrong with the unit. Continued abnormal operation may cause electric shock or fire.

When removing the plug from the power supply outlet, grip the power supply plug, not the cord. Pulling the cord may result in electric shock or fire by short circuit.

Disconnect the power supply plug before moving the unit. Take care not to damage the power cord. A damaged cord may cause electric shock or fire.

Disconnect the power plug when the unit is not used for long periods. Keeping the connection may cause electric shock, current leakage, or fire due to the deterioration of insulation.

The disposal of the unit should be accomplished by appropriate personnel.

Do not put the packing plastic bag within reach of children as suffocation may result.

⚠CAUTION

Use a dedicated power source (a dedicated circuit with a breaker) as indicated on the rating label attached to the unit. A branched circuit may cause fire resulting from abnormal heating.

Connect the power supply plug to the power source firmly after removing the dust on the plug. A dusty plug or improper insertion may cause a heat or ignition.

Check the setting when starting up of operation after power failure or turning off of power switch. The stored items may be damaged due to the change of setting.

Prepare a safety check sheet when you request any repair or maintenance for the safety of service personnel.

ENVIRONMENTAL CONDITIONS

This equipment is designed to be safe at least under the following conditions (based on the IEC 61010-1):

■ Indoor use;

■ Altitude up to 2000 m;

■ Ambient temperature 5°C to 40°C

■ Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C;

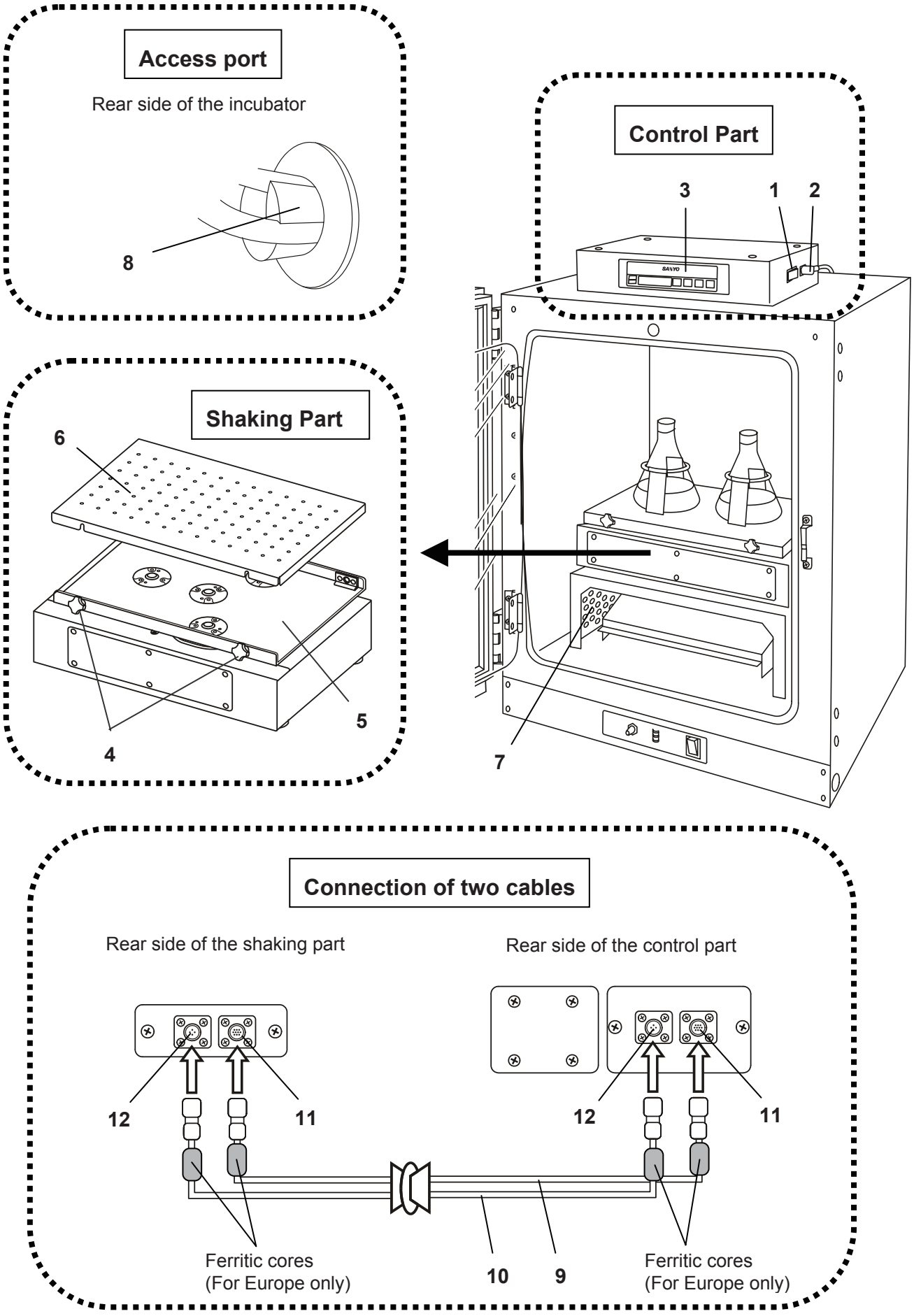
■ Mains supply voltage fluctuations not to exceed ±10% of the nominal voltage;

■ Other supply voltage fluctuations as stated by the manufacturer;

■ Transient overvoltages according to Installation Categories (Overvoltage Categories) II; For mains supply the minimum and normal category is II;

■ Pollution degree 2 in accordance with IEC 60664.

SHAKER COMPONENTS



1. Power switch: Main switch of the shaker. Also functions as an over-current breaker.

2. Power supply cord port: Use the enclosed power supply cord.

3. Control panel: The revolution speed and operating time can be set through the control panel.

4. Screw fixing platform: This screw is used to fix the platform to the top plate.

5. Top plate: The platform or spring rack can be fixed on this plate. The surface can be cleaned after the platform is removed.

6. Platform (Optional component MIR-38PFT/MIR-38PFN): The clamps or test tube rack can be fixed on the platform. It can be cleaned by removing.

7. Stand: When using in CO_2 incubator, put the shaking part on this stand.

8. Rubber cap for S100C: Place the rubber caps on the access port on an incubator both outside and inside when using the MIR-S100C.

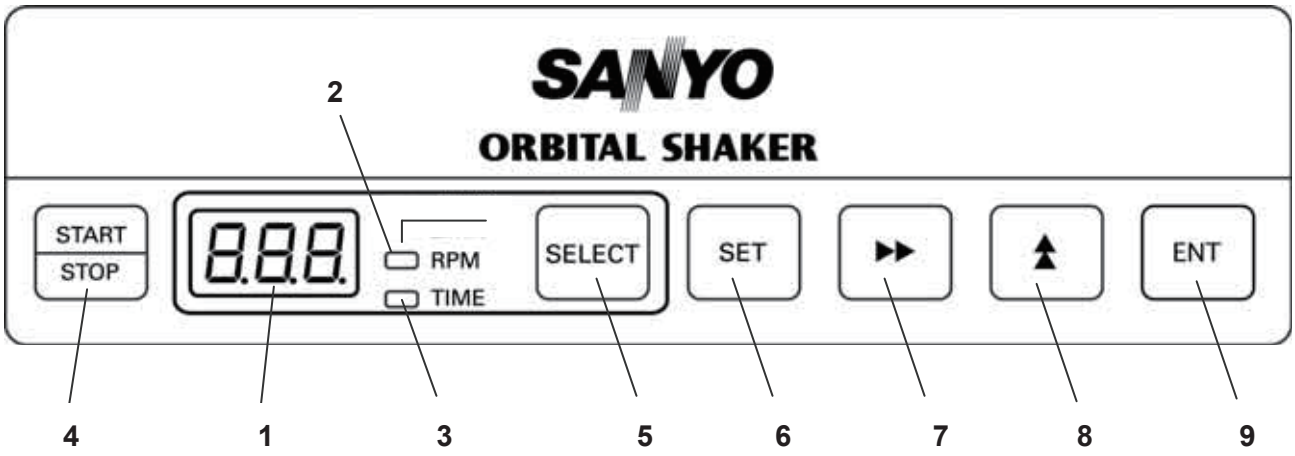
9. Cable (10 pins): 2 ferritic cores are attached only for Europe. Connect it to the cable port (10 pins) with its white arrow facing upward. (Both of the control part and the shaking part)

10. Cable (4 pins): 2 ferritic cores are attached only for Europe. Connect to the cable port (4 pins) with its white arrow facing upward. (Both of the control part and the shaking part)

11. Cable port (10 pins): Connect the cable (10 pins).

12. Cable port (4 pins): Connect the cable (4 pins).

Control panel and keypad



1. Display of revolution speed and time
In operation, this indicator shows the revolution speed or time. The time display is indicated 0.1 hours (6 minutes) in more than 6 minutes indication and by a second in less than 6 minutes indication.
In timer running, the indicator shows expiration time. In continuous running, it shows accumulated time up to 99.9 hours.
In setting mode, the indicator shows setting value of a revolution speed or time. The display can change over by pressing select key. And this indicator also shows the error code when detects abnormal by self-diagnosis function.

2. RPM lamp (RPM): This lamp lights when the display shows the revolution speeds, and blinks during the revolution speed setting mode.

3. TIME lamp (TIME): This lamp lights when the display shows the remaining time or elapsed time, and blinks during setting mode of time.

4. Start/Stop key (START/STOP): Pressing this key gets the shaker started. Pressing this key again stops the shaker.

5. Select key (SELECT): Pressing this key changes over setting or present value of revolution speed and time in the display of revolution speed and time.

6. Set key (SET): Pressing this key enable the revolution speed and time to be set. Indication in the display will blink during the setting mode.

7. Digit shift key (▶▶): Pressing this key in the setting mode causes the changeable digit to shift. Press this key more than 5 seconds to enter the key lock mode.

8. Numerical value shift key (▲): Pressing this key in the setting mode causes the numerical value to shift. Press this key more than 5 seconds to enter function mode.

9. Enter key (ENT): Pressing this key ensures and memorizes the set value.

Note:
Power failure alarm (PF display, buzzer < intermittent tone >) is released by pushing any key.

INSTALLATION SITE

To operate this unit properly and to obtain maximum performance, install the unit in a location with the following conditions:

■ **Make sure that the CO_2 incubator is installed correctly.**
Refer to "INSTALLATION SITE" of the operation manual of the CO_2 incubator for installation of the CO_2 incubator.

■ **Make sure to use the stand.**
Refer to page 11 for installation of the stand (Fig.1)

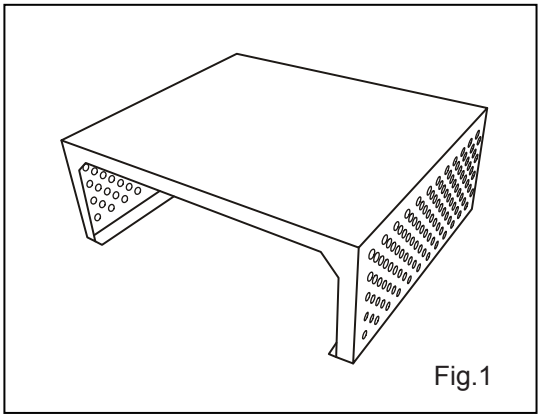


Fig.1

⚠ WARNING
The nonuse of the stand may break tray support of the CO_2 incubator, or result in injury from the shaking part moving or falling.

■ **A location not prone to high humidity (Control part)**
Install the unit in the ambient of 80% R.H. or less humidity. Installation under high humidity may cause current leakage or electric shock.

⚠ WARNING
Do not use the unit outdoors. Current leakage or electric shock may result if the unit is exposed to rain water.
Never install the unit in a humid place or a place where it is likely to be splashed by water. Deterioration of the insulation may result which could cause current leakage or electric shock.

■ **A location without flammable or corrosive gas**

⚠ WARNING
Never install the unit in a flammable or volatile location. This may cause explosion or fire or may result in the current leakage or electric shock by the corrosion of the electrical components.
Never install the unit where acid or corrosive gases are present as current leakage or electric shock may result due to corrosion.

⚠ CAUTION
When operating a shaker in the CO_2 incubator, the vibrations generated by the shaker may adversely affect the static culture outcome in the adjacent incubator.

⚠ CAUTION
When a stationary culture is conducted on a tray put in the space above a shaker installed in the CO_2 incubator, the vibrations generated by the shaker may adversely affect the culture outcome.

START-UP OF UNIT

> **⚠ CAUTION**
> **Never install the shaking part on the tray of the CO_2 incubator.** This may result in damage of tray or tray support in CO_2 incubator.
> To prevent unbalance, install the shaking part at the center of the stand.

Starting trial operation or operation of this shaker, shall be followed by the next procedure.

1. Remove the packaging materials and tapes.

2. If the product is dirty, clean it with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off it with a dry cloth.

3. Take out all trays, tray supports and side supports from the chamber of a CO_2 incubator. If the CO_2 incubator is dirty too, clean it like step 2.

4. Fix the 4 rubber feet to the stand with 4 screws, and install in CO_2 incubator. (Fig.1)

5. Fix the platform MIR-38PFT or MIR-38PFN (optional component) to the top plate. Set a platform along with two stopping holes in rear of the top plate, and secure the platform by the two fixing screws (Fig.2).

6. Connect the 2 cables (10 pins and 4 pins) with cable ports on the back of the shaking part (Fig.3). Refer to page 7 and 8 for details.

6. Pass the other side of connected cables through the access port of the CO_2 incubator, and cap the access port with attached rubber caps for S100C. (Both outside and inside)

7. Install the shaking part at the center of the stand. (Fig.4)

8. Install the control part on the CO_2 incubator, connect the cable passed through the access port with cable ports in the back of the control part (Fig.5). Refer to page 7 and 8 for details.

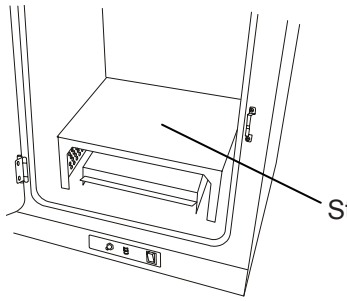


Fig.1

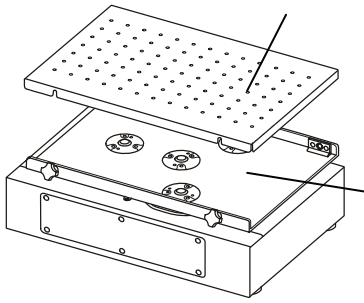


Fig.2

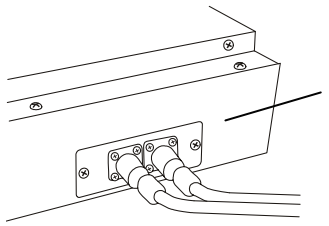


Fig.3

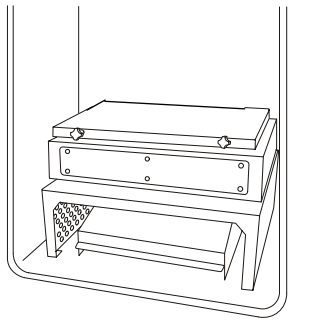


Fig.4

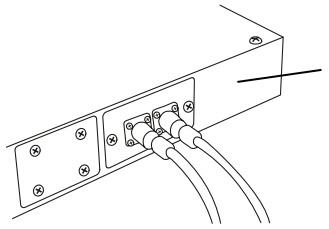


Fig.5

⚠ CAUTION

It is possible to install in following incubators:

MCO-20AIC, MCO-19AIC, MCO-19AIC(UV), MCO-19AIC(UVH), MCO-18AIC, MCO-18AIC(UV), MCO-19M, MCO-19M(UV), MCO-19M(UVH)

Sanyo cannot guarantee performance when using in CO_2 incubators other than the above.

It is not possible to sterilize MIR-S100C by H_2O_2 decontamination function of Sanyo incubators.

FIXING A SAMPLE ONTO THE PLATFORM

●Fix an Erlenmeyer flask to platform

Screw the optional clamp to the platform and set an Erlenmeyer flask in it. (Refer to page 14)

Do not get the Erlenmeyer flask out of platform widely. In case of setting in an incubator, there is the possibility of touching the wall inside.

⚠CAUTION

Fix a clamp to the platform securely. Improper fixing is dangerous. To prevent unbalance, set an Erlenmeyer flask symmetrically at the center of the platform, and do not get the flasks out of platform widely.

Reduce the revolution speed when the total weight of flasks exceed the allowable limit. (To prevent abnormal vibration.)

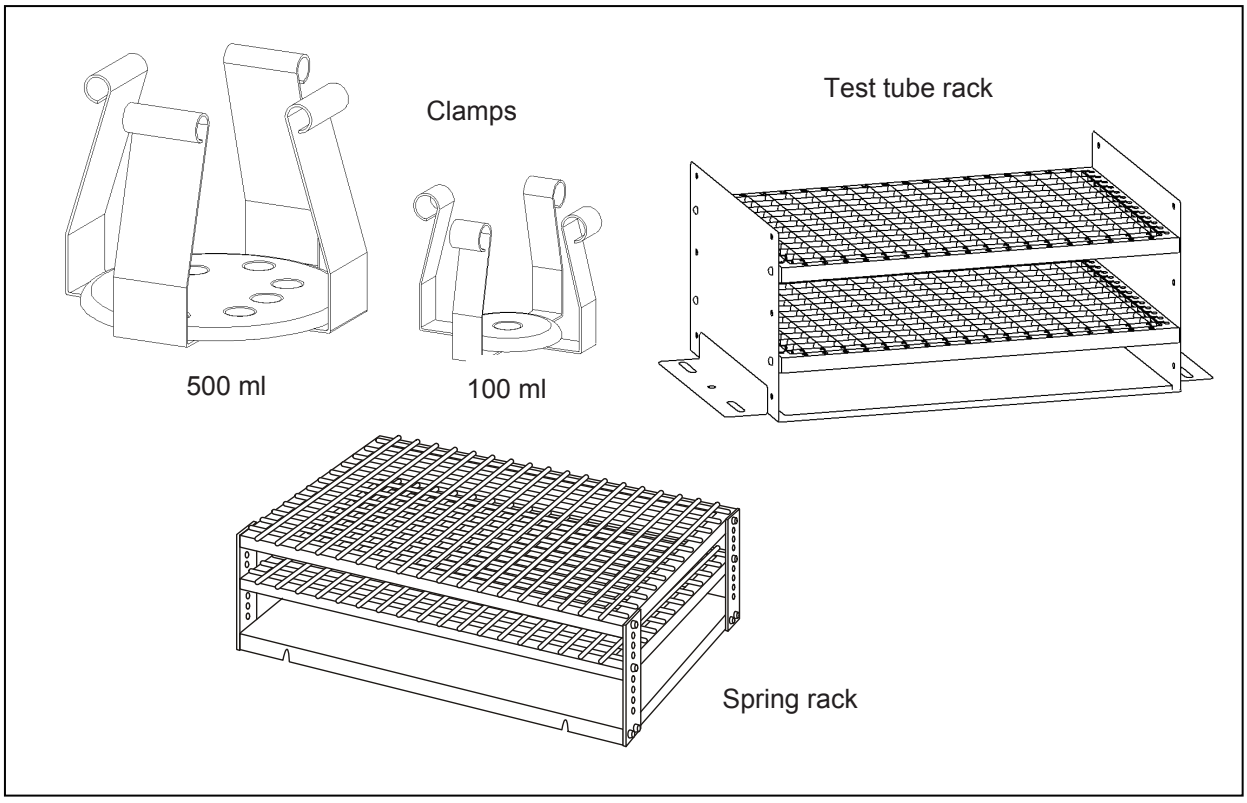
OPTIONAL COMPONENTS

[Optional components]
The following table lists for the MIR-S100C.

Variety	Model	Applicable flask	Maximum Mounting Quantity for each platform	
			MIR-38PFT	MIR-38PFN
Clamp	MIR-51FC	50 ml Erlenmeyer Flask	18 pcs.	20 pcs.
	MIR-101FC	100 ml Erlenmeyer Flask	15 pcs.	11 pcs.
	MIR-201FC	200 ml Erlenmeyer Flask	9 pcs.	6 pcs.
	MIR-301FC	300 ml Erlenmeyer Flask	9 pcs.	6 pcs.
	MIR-501FC	500 ml Erlenmeyer Flask	5 pcs.	6 pcs.
	MIR-1001FC	1000 ml Erlenmeyer Flask	3 pcs.	3 pcs.
	MIR-2001FC	2000 ml Erlenmeyer Flask	2 pcs.	2 pcs.
Test tube rack	MIR-204SC	Various test tube	1 pc.	1 pc.
Spring rack	MIR-38SP	Various test tube	All in one rack	

(Max clamps)

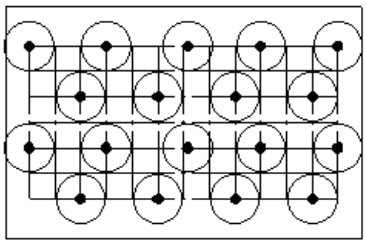
[Clamp example]



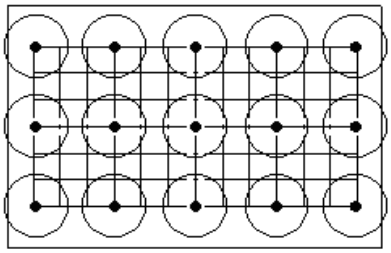
●Fix a selected clamp to the platform firmly with M4 screw (MIR-38PFT) or M5 screw (MIR-38PFN) <A flask of 50-300 ml is fixed by one screw and that of 500-2000 ml is fixed by four screws>. Set the clamp symmetrically with respect to the center point of platform. (Refer to page 15 and 16)
●The spring of clamp may lose holding power after long-term usage. Replace the spring of clamp as necessary.
●About optional components, contact a Sanyo sales representative or agent.

LOCATION OF ERLENMEYER FLASK

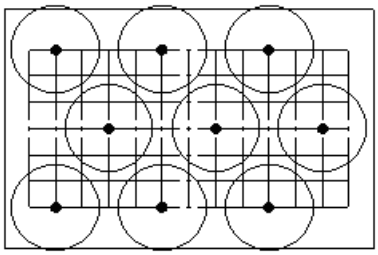
Location of Erlenmeyer flask (MIR-38PFT)



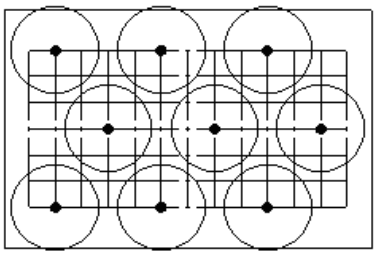
50 ml Erlenmeyer flask × 18



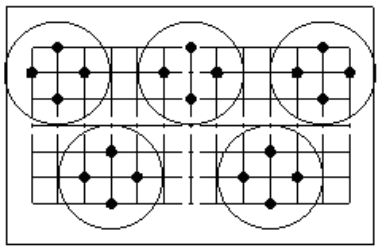
100 ml Erlenmeyer flask × 15



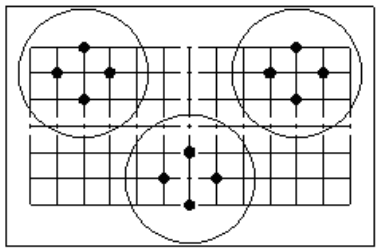
200 ml Erlenmeyer flask × 9



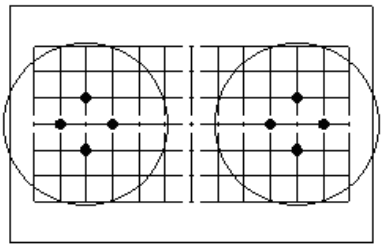
300 ml Erlenmeyer flask × 9



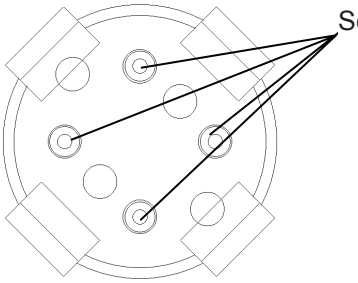
500 ml Erlenmeyer flask × 5



1000 ml Erlenmeyer flask × 3

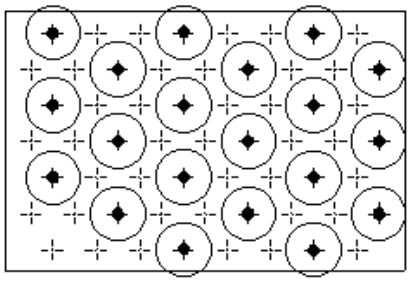


2000 ml Erlenmeyer flask × 2

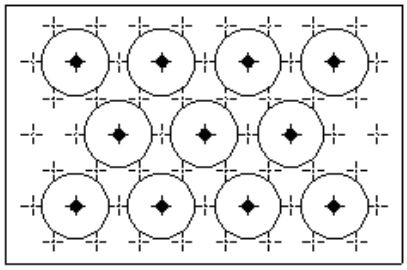


Screw holes location of clamps
for 500-2000 ml flasks

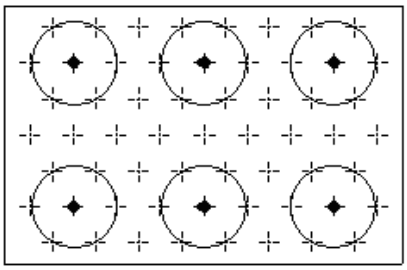
Location of Erlenmeyer flask (MIR-38PFN)



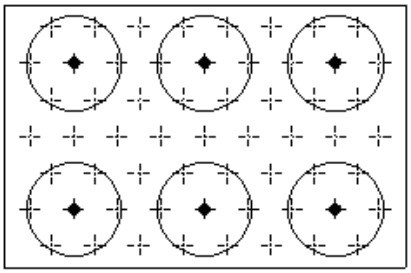
50 ml Erlenmeyer flask × 20



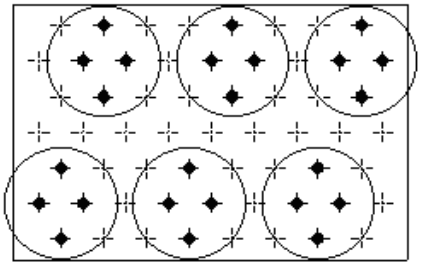
100 ml Erlenmeyer flask × 11



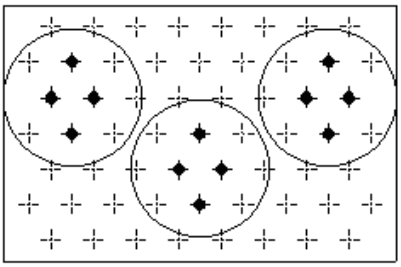
200 ml Erlenmeyer flask × 6



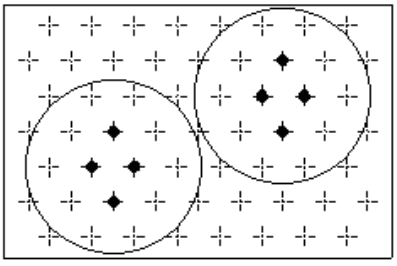
300 ml Erlenmeyer flask × 6



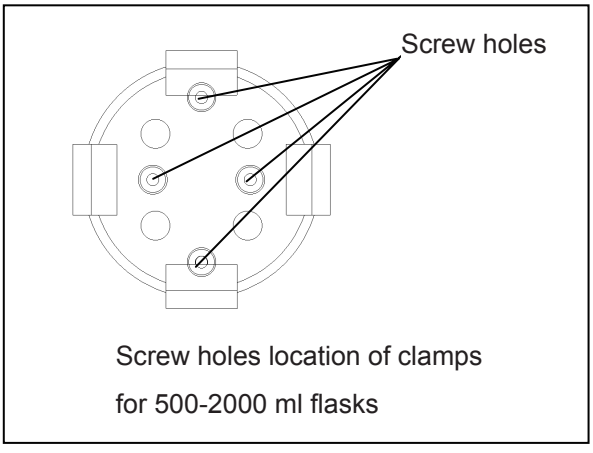
500 ml Erlenmeyer flask × 6



1000 ml Erlenmeyer flask × 3



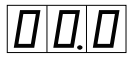
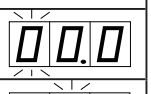
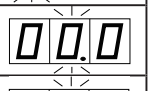
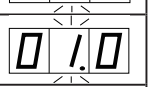
2000 ml Erlenmeyer flask × 2



OPERATION OF CONTROL PANEL

The table below shows the basic procedure for setting the control panel. The example in the table is based on the assumption that the revolution speed is 125 rpm and the culture time is 1 hour.
Note: The unit is set at the factory that the revolution speed is 40 rpm and culture time is continuous running (00.0).

Table1 Basic operation sequence (Example：revolution speed 125 rpm, culture time 1 hour)

	Description of operation	Key operated	Indication after operation
1	Turn the power switch ON	-----	The figure of 0 is shown in the display of revolution speed and time, and RPM lamp lights.*1
2	Press set key.	SET	The left digit and RPM lamp blink.
3	By pressing numerical value shift key and digit shift key, set the figure to 125.	▲▲	When pressed, the changeable digit is shifted.
		▶▶	When pressed, the figure of settable digit changes.
4	Press enter key.	ENT	The revolution speed is memorized, and back to the initial display.
5	Press select key.*2	SELECT	Timer mode is shown in the display of revolution speed and time, and TIME lamp lights. 
6	Press set key.	SET	The left digit and TIME lamp flash. 
7	By pressing digit shift key and numerical value shift key, set the figure to 01.0.	▶▶	When pressed, the changeable digit is shifted. 
		▲▲	When pressed, the figure of settable digit changes. 
8	Press enter key.	ENT	Timer setting is memorized, and back to the initial display.
9	Press start/stop key.	START/STOP	Start operation in 125 rpm and the remaining time is indicated.

***1.** When TIME lamp is lighted, turn on RPM lamp by pressing select key (SELECT).

***2.** Culture time is 00.0 (continuous running) in default.

Note:

●Settable range of culture time is from 0 to 99 hours 54 minutes (00.0-99.9). Setting value of 00.0 is a continuous running.

●Count down display is shown by 0.1 hour until remaining times is 6 minutes, and shown by 1 second when remaining time is less than 5 minutes 59 seconds.

●In case of not using timer mode (culture time setting is 00.0), timer indicator displays total running time.

⚠CAUTION

Handle the reagents and samples used to react with care. In case of accidental entry into the eyes or ingestion, this may be harmful to health. In terms of toxicity of regents, inquire at a regent manufacturer.
Handle the samples and reaction products. Contamination between samples may cause unexpected harmful products.

⚠CAUTION

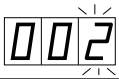
Do not get up the body in operation. This may cause injury by catching a finger between the body and platform.

SETTING THE ROTATIONAL ACCELERATION

The table below shows the basic procedure for setting a rotational acceleration speed at the start up. The acceleration speeds has 3 speeds (1, 2, 3). Speed 3 is the fastest.

Note: The unit is set at the factory that the rotational acceleration is 2.

Table 2 Procedure for changing a rotational acceleration speed. (Example: changing from 2 to 3.)

	Description of operation	Key operated	Indication after operation
1	Press numerical value shift key for 5 seconds.	▲▲	A function mode is shown in the display of revolution speed and time.
2	By pressing digit shift key and numerical value shift key, set the figure to F23.	▶▶	When pressed, the changeable digit is shifted.
		▲▲	When pressed, the figure of settable digit changes.
3	Press enter key.	ENT	When pressed, the current acceleration speed blinks. 
4	Press numerical value shift key and scroll the figure from 2 to 3.	▲▲	When pressed, the acceleration speed value changes.
5	Press enter key.	ENT	Set and back to the initial display.

*Do not change other functional code except F23.

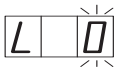
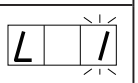
KEY LOCK FUNCTION

This shaker is provided with a key lock function which disable START/STOP and change of setting value by the key operation.

Note: The unit is set at the factory that key lock is OFF (L0)

	MODE	FUNCTION
L 0	Key lock OFF	Enable to change
L 1	Key lock ON	Disable to change

Table 3 Procedure for key lock setting (change from key lock OFF to key lock ON)

	Description of operation	Key operated	Indication after operation
			Displays current RPM or the time.
1	Press digit shift key for 5 seconds.	▶▶	Displays L0 in the display of revolution speed and time. 
2	Set 1 in initial place by pressing numerical value shift key.	▲▲	When pressed, the figure of settable digit changes. 
3	Press enter key.	ENT	Key lock on and current RPM or the time is dispayed.

●A key lock function is valid for start/stop, and the setting of revolution / culture time function only. (Entering setting mode and check of setting value is possible, but change of setting value is impossible.)

●For release of key lock, select key lock OFF (L0).

ALARMS & SAFETY FUNCTIONS

This shaker has the alarms and safety functions as shown in table 4, and also self diagnostic functions.

Table 4 Alarms and safety functions

Alarm & Safety	Situation	Indication	Buzzer	Safety operation	Releasing method
Key lock	When the key lock is “ON”	-----	-----	Unable of setting change and start/stop operation.	-----
Auto start after power failure.* [1]	Auto start after power failure.	Alternative indication of PF*[2]/real revolution	Intermittent tone	-----	Press any key.
Auto return	When there is no key pressing in each setting mode for 90 seconds.	-----	-----	PV*[3] indication after 90 seconds (return RPM or time)	-----
Temperature abnormality	When the shaker temp. is higher than over-heat limit temp.	“E08” blinks	Intermittent tone	shutdown	Turns off the power switch, and turn on again.
Revolution abnormality	Revolution speed do not arrive setting speed or over setting speed. Or deviating 10 rpm from setting speed even after being stabilized	“E07” blinks	Intermittent tone		
Motor overlord protection circuit	When the motor is overloaded and the overcurrent is detected.	“E06” blinks	Intermittent tone		
Maintenance notice function *[4]	Total running time is 5,000 hours or more.	“CH3” flashes twice after power-ON.	-----	-----	-----
Maintenance notice function *[4]	Total running time is 10,000 hours or more.	“CH1” flashes twice after power-ON.	-----	-----	-----
Failure predicting function*[5]	When the arrival time to 100 rpm (or to setting RPM if it is less than 100 rpm) takes 90 sec. or more.	“CH2” flashes twice just after starting operation.	-----	-----	-----

***1.** Auto start after PF : The shaker restarts operation after power failure when shaker stops operation by power failure. The timer is not counted during power failure and the count is resumed after power failure when the timer mode selected.

***2.** PF : Power Failure

***3.** PV : Present Value

***4.** Maintenance notice function : This function is to notice the replacement of consumable parts. (Refer to page 21)

***5.** Failure predicting function : This function is to notify the abnormality of MIR-S100C when it dose not achieve average revolution. (When “CH2” flashes twice with maximum allowable load weight, it is recommend to call for service.)

ROUTINE MAINTENANCE

Cleaning

Perform the following procedure to clean the MIR-S100C when use it for the first time or contaminate under the platform.

●Clean removing platform with a diluted neutral dishing detergent with distilled water.
●Wipe the interior parts and inside platform with alcohol for sterilization and then wipe off with a dry gauze so as not to remain alcohol for the sterilization.
●Do not use an acid, alkaline or other halogen-based solution because this may cause rust.
●Clamps can be disinfected by an autoclave.
●Wipe the spilt medium, otherwise it may cause mold or rust.
●In case of heavy dirt, contact a Sanyo sales representative or agent.

⚠CAUTION
Wear rubber gloves when cleaning. Barehanded work may result in injury by a corner of a platform.

Disinfection in shaking part

1. Remove 6 screws to remove the plate on the front of the shaking part. (Fig.1)

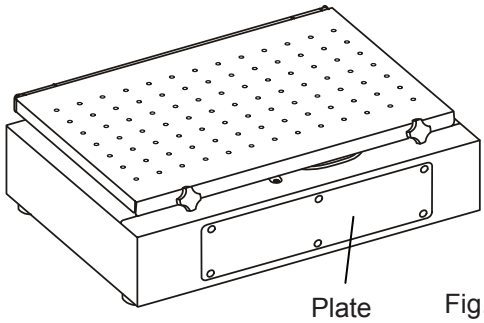


Fig.1

2. The windows for disinfection appear when plate is detached. (Fig.2)
It is possible to disinfect inside of the shaking part by spraying disinfectant through the windows for disinfection.

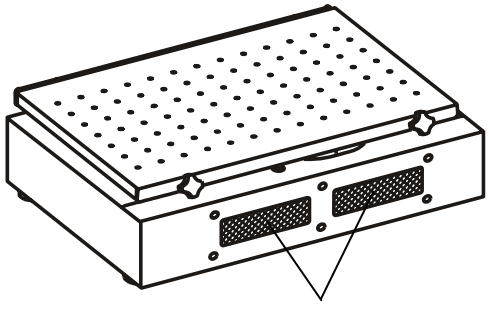


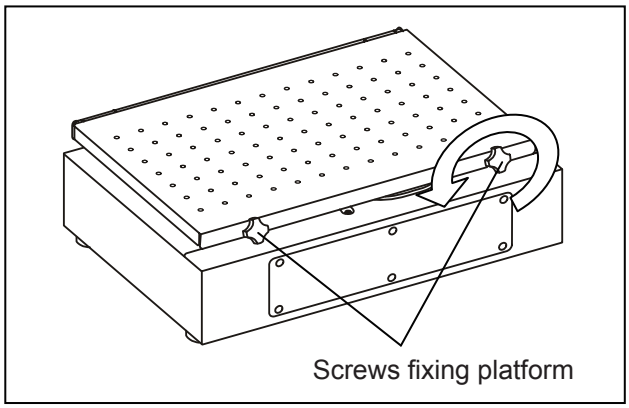
Fig.2

⚠CAUTION
It is not guaranteed to keep aseptic the inside of shaking part completely though shaking part is made of a lot of copper alloyed (antibacterial) stainless steel parts.

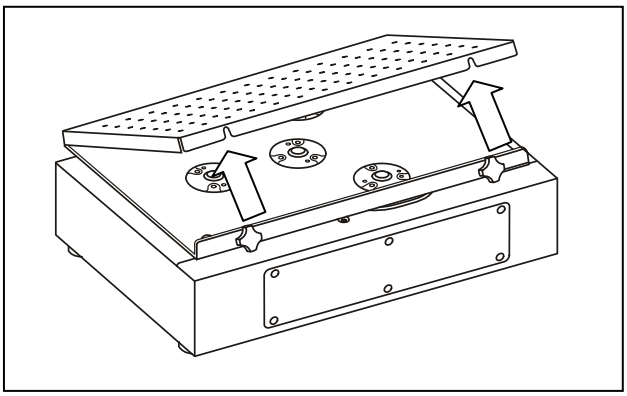
Removal of platform

1. Turn off the power switch and detach 2 cables from cable ports on the back of shaking part.

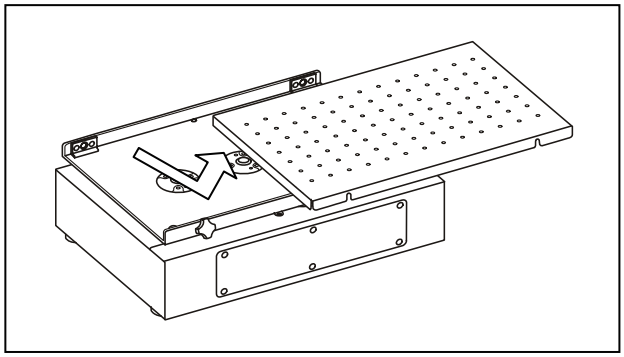
2. Rotate the screws fixing platform to counterclockwise direction.



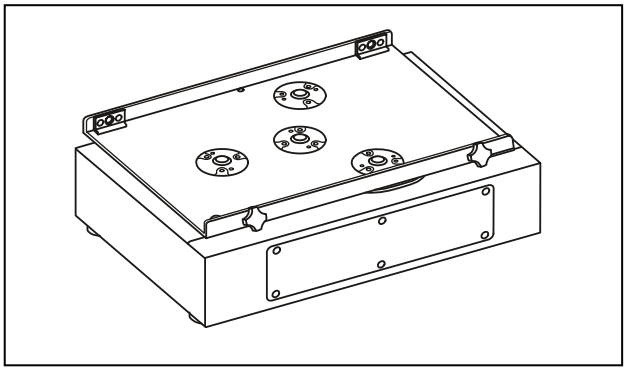
3. Pick up the platform at the front.



4. Pull the platform forward.



5. Below is the shaker removed the platform.



6. To replace the platform, follow the procedure in reverse.

Replacement of consumable parts

The belt and bearing used in MIR-S100C are consumable parts. MIR-S100C has a maintenance notice function.

After turning the power switch on, the blinking “CH3" twice in the display of revolution speed and time shows that the exchange of the belt is necessary. And “CH1” shows that the exchange of the belt and the bearing. For the replacement, contact a Sanyo sales representative or agent.

TROUBLESHOOTING

If the unit malfunctions, check out the following before calling for service.

Malfunction	Check/Remedy
The shaker does not operate at all.	• The shaker is not plugged correctly into a power outlet. • Control part and shaking part are not connected correctly by 2 cables. • The circuit breaker at the power source is active or a power failure has occurred. • The power supply cord is not connected to the port on the right side of the control part.
The key operations is disabled.	• The key lock function is set in ON mode. (Refer to page 18) • Under the setting mode.
The alarm function operates.	• The shaker is not running within a correct temperature range.
Shaker speed goes down to lower than the set value.	• Shaking part is not on the stand. • Flask is not fixed securely. • Location of clamp is not right. • Amount of culture medium is not right.
The shaker stops during operation.	• The timer function is set to ON mode.
“CH2” flashes in display after starting operation.	• The sample weight on platform is too much. The allowable load weight is 5 kg.

Note:
If the malfunction is not eliminated after checking the above items, or the malfunction is not shown in the above table, contact Sanyo sales representative or agent.

DISPOSING OF THE UNIT

When disposing of the unit, contact a Sanyo sales representative or agent.

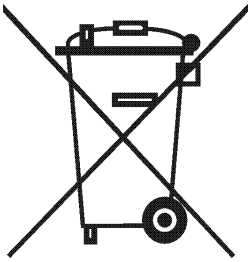
⚠WARNING

The unit must be dismantled and disposed of by qualified personnel only. If the unit is left where outsiders enter, it may result unexpected accident.

Before disposing of the unit with biohazardous danger, decontaminate the unit to the extent possible by the user.

Note:
This symbol mark and recycle system are applied only to EU countries and not applied to the countries in the other area of the world.

Waste Electrical and Electronic Equipment (WEEE) Directive-2002/96/EC



(English)
Your SANYO product is designed and manufactured with high quality materials and components which can be recycled and reused.

This symbol means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from your household waste.

Please dispose of this equipment at your local community waste collection/recycling centre.

In the European Union there are separate collection systems for used electrical and electronic products.

Please help us to conserve the environment we live in!

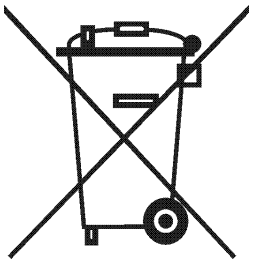
(German)
Ihr SANYO Produkt wurde entworfen und hergestellt mit qualitativ hochwertigen Materialien und Komponenten, die recycelt und wiederverwendet werden können.

Dieses Symbol bedeutet, daß elektrische und elektronische Geräte am Ende ihrer Nutzungsdauer von Hausmüll getrennt entsorgt werden sollen.

Bitte entsorgen Sie dieses Gerät bei Ihrer örtlichen kommunalen Sammelstelle oder im Recycling Centre.

In der Europäischen Union gibt es unterschiedliche Sammelsysteme für Elektrik- und Elektronikgeräte.

Helfen Sie uns bitte, die Umwelt zu erhalten, in der wir leben!



(French)
Votre produit Sanyo est conçu et fabriqué avec des matèriels et des composants de qualité supérieure qui peuvent être recyclés et réutilisés.

Ce symbole signifie que les équipements électriques et électroniques en fin de vie doivent être éliminés séparément des ordures ménagères.

Nous vous prions donc de confier cet équipement à votre centre local de collecte/recyclage.
Dans l'Union Européenne, il existe des systèmes sélectifs de collecte pour les produits électriques et électroniques usagés.

Aidez-nous à conserver l'environnement dans lequel nous vivons !

Les machines ou appareils électriques et électroniques contiennent fréquemment des matières qui, si elles sont traitées ou éliminées de manière inappropriée, peuvent s'avérer potentiellement dangereuses pour la santé humaine et pour l'environnement.
Cependant, ces matières sont nécessaires au bon fonctionnement de votre appareil ou de votre machine. Pour cette raison, il vous est demandé de ne pas vous débarrasser de votre appareil ou machine usagé avec vos ordures ménagères.

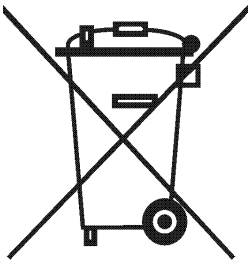
(Spanish)
Los productos SANYO están diseñados y fabricados con materiales y componentes de alta calidad, que pueden ser reciclados y reutilizados.

Este símbolo significa que el equipo eléctrico y electrónico, al final de su ciclo de vida, no se debe desechar con el resto de residuos domésticos.

Por favor, deposite su viejo "televisor" en el punto de recogida de residuos o contacte con su administración local.

En la Unión Europea existen sistemas de recogida específicos para residuos de aparatos eléctricos y electrónicos.

Por favor, ayúdenos a conservar el medio ambiente!



(Portuguese)
O seu produto SANYO foi concebido e produzido com materiais e componentes de alta qualidade que podem ser reciclados e reutilizados.

Este símbolo significa que o equipamento eléctrico e electrónico no final da sua vida útil deverá ser descartado separadamente do seu lixo doméstico.

Por favor, entregue este equipamento no seu ponto local de recolha/reciclagem.

Na União Europeia existem sistemas de recolha separados para produtos eléctricos e electrónicos usados.

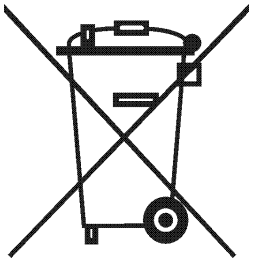
Por favor, ajude-nos a conservar o ambiente em que vivemos!

(Italian)
Il vostro prodotto SANYO è stato costruito da materiali e componenti di alta qualità, che sono riutilizzabili o riciclabili.

Prodotti elettrici ed elettronici portando questo simbolo alla fine dell'uso devono essere smaltiti separatamente dai rifiuti casalinghi.

Vi preghiamo di smaltire questo apparecchio al deposito comunale.
Nell'Unione Europea esistono sistemi di raccolta differenziata per prodotti elettrici ed elettronici.

Aiutateci a conservare l'ambiente in cui viviamo!



(Dutch)
Sanyo producten zijn ontwikkeld en gefabriceerd uit eerste kwaliteit materialen, de onderdelen kunnen worden gerecycled en weer worden gebruikt.

Het symbool betekent dat de elektrische en elektronische onderdelen wanneer deze vernietigd gaan worden , dit separaat gebeurt van het normale huisafval.

Zorg ervoor dat het verwijderen van de apparatuur bij de lokaal erkende instanties gaat gebeuren.
In de Europese Unie wordt de gebruikte elektrische en elektronische apparatuur bij de daarvoor wettelijke instanties aangeboden.

Alstublieft help allen mee om het milieu te beschermen.

(Swedish)
Din SANYO produkt är designad och tillverkad av material och komponenter med hög kvalitet som kan återvinnas och återanvändas.

Denna symbol betyder att elektriska och elektroniska produkter, efter slutanvändande, skall sorteras och lämnas separat från Ditt hushållsavfall.

Vänligen, lämna denna produkt hos Din lokala mottagningstation för avfall/återvinningsstation.

Inom den Europeiska Unionen finns det separata återvinningssystem för begagnade elektriska och elektroniska produkter.

Vänligen, hjälp oss att bevara miljön vi lever i!

SPECIFICATIONS

Name		Shaker for CO_2 incubator	
Model		MIR-S100C	MIR-S100C (for Europe)
External dimensions	Shaking part	W409 x D275 x H118 mm	
	Control part	W365 x D275 x H93 mm	
Exterior	Shaking part	Copper alloyed stainless steel	
	Control part	Painted steel	
Platform dimensions		W380 x D250 mm	
Platform		Copper alloyed stainless steel	
Shaking motion		Circling	
Amplitude (Circling diameter)		20 mm	
Revolution		40 - 200 rpm	
Allowable load weight		5 kg	
Flask intake capacity		100ml Erlenmeyer Flask : x 15 500ml Erlenmeyer Flask : x 5 (MIR-38PFT) 100ml Erlenmeyer Flask : x 11 500ml Erlenmeyer Flask : x 6 (MIR-38PFN)	
Display		3-digit LED (speeds/time changeable)	
Motor		DC brushless motor	
Accessories		Rubber cap for MIR-S100C × 2, Power supply cord, Stand, Rubber foot × 4, Screw (M5) × 4	
		Cable (3 m) x 2 (10 pins and 4 pins)	Cable (3 m) with ferritic cores x 2 (10 pins and 4 pins)
Power source		100 – 240 V, 50/60 Hz	
Weight		16 kg	
Optional component		Platform (MIR-38PFT, MIR-38PFN) Clamp (MIR-51FC/101FC/201FC/301FC/501FC/1001FC/2001FC) Test tube rack (MIR-204SC), Spring rack (MIR-38SP)	

Note: Design or specifications will be subject to change without notice.

PERFORMANCE

Name		Shaker for CO_2 incubator	
Model		MIR-S100C	MIR-S100C (for Europe)
Power consumption		Max. 17.6 W	
Rated voltage, frequency		115 V, 60 Hz	230 V, 50 Hz
Amperage		Max. 0.16 A	Max. 0.11 A
Heat emission		Max. 63 kJ/h	
Noise level		38.9 dB	
Applicable environment condition	Shaking part	Temperature; 0 - 50°C in CO_2 incubator	
	Control part	Temperature; 0 - 40°C Humidity; equal or less than 80 %RH	

Note: The unit with CE mark complies with EC directives.
These data based on our measuring method.

⚠ CAUTION

Please fill in this form before servicing.
Hand over this form to the service engineer to keep for his and your safety.

Safety check sheet

1. Cultured bacteria or cells: ☐Yes ☐No
   Risk of infection: ☐Yes ☐No
   Risk of toxicity: ☐Yes ☐No
   Risk from radioactive sources: ☐Yes ☐No

   (List all potentially hazardous materials that have been cultured by this unit.)
   Notes :

2. Contamination of the unit
   No contamination ☐Yes ☐No
   Decontaminated ☐Yes ☐No
   Contaminated ☐Yes ☐No

3. Instructions for safe repair/maintenance of the unit
   a) The unit is safe to work on ☐Yes ☐No
   b) There is some danger (see below) ☐Yes ☐No
   Procedure to be adhered to in order to reduce safety risk indicated in b) below.

Date :
Signature :
Address, Division :
Telephone :

Product name :	Model :	Serial number :	Date of Installation :
Shaker for CO_2 incubator	MIR-S100C		

Please decontaminate the unit yourself before calling the service engineer.

SANYO Electric Co., Ltd
Printed in Japan